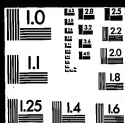


1 2 3 4 5 6 7 8 9 10 11 12
CENTIMETERS



14:1

Thomas A Edison Papers

A SELECTIVE MICROFILM EDITION

*PART V
(1911-1919)*

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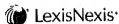
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**Thomas A. Edison Papers
at
Rutgers, The State University of New Jersey
endorsed by
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START

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A Note on the Sources

**The pages which have been
filmed are the best copies
available. Every technical
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made to ensure legibility.**

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NOTEBOOK SERIES
NOTEBOOKS BY EDISON

**Notebook Series -- Notebooks by Edison
Notebook, N-13-11-22**

This notebook was used by Edison during November-December 1913; one entry contains notations by an unidentified experimenter. The entries relate to a sequence of experiments, numbered from 15 to 90, which continue the experiments in N-13-08-14.2. They pertain primarily to the printing and transfer processes involved in disc record manufacture. Included are notes and results from experimental batches of transfers made according to different production schedules, different varnish compositions, or different preparations of the record blanks. Also included are descriptions of the various scrapers used in the preparation of the record blanks. Entry 55 directs Sherwood T. (Sam) Moore that "for present this is our Transfer & Printing Schedules." Another entry describes Charles Dally's "slot screen" experiments, which were intended to improve the quality of the screening of powder for the powder blanks. At the end of the book is an entry on the testing of "Dinwiddie's grafted tracked White Masters." The notes indicate that Walter H. Miller and Ernest C. Richter also assisted in the experiments. Inserted into the book are two loose pages of related notes by Edison. The front cover is labeled "Disc Records." The pages are unnumbered. Approximately 150 pages have been used.

to 15 Schedules

3 Minutes at 500 ^{lbs} with steam

Cool, 3 plates -

Many Birds!!!

Has also outer red line
in row -

One, has row red bands also
nearly the entire circumference.

Special Expt

2 C

1 Low

5 High 800 lbs - pressure
not held but allowed gradually
dis down to 125 lbs

OK

Bird III shallow

No 16

No Contact ^{at Top press} leaves in
press $\frac{1}{16}$ from touching. Ref
for 7 min then bring
up to 800 lb for
5 min & Cool
Transfers 6 ^{Free 1} Stick 11

OK 11

3 buds Tap - 111
Inverhurd Bottom 1

Red Buttons, Red Gd.

17 Ept

2 Contual 1 low 5 high 800
then drop press & cool.
free release —

OK.

Tops bad - bottoms pretty good

Study these -
Very Important

after transfer

- 1 plate $\frac{1}{8}$ - see ridge plain
- 2 $\frac{1}{8}$
- 3 $\frac{1}{8}$
- 4 $\frac{1}{8}$ standard up $\frac{1}{16}$ -
- 5 $\frac{1}{8}$ standard down - no (up) at mid, but is one at $2\frac{1}{2}$ "
- 6 $\frac{1}{8}$ - $\frac{1}{16}$ -
- 7 $\frac{1}{8}$ -
- 8 standard up one way
- 9 has no center
- 10 nearly flat.
- 11 $\frac{1}{8}$
- 12 $\frac{1}{8}$.

This shows plates don't
straighten up -
after 12 hrs off

Prints

OK !!

Not filled with noise III inside edge label

Cracks 1

This proves plates are this kind
Bad -

No 17 $\frac{1}{2}$
No 1 schedule with
3 control y run at 800 - coal.
Plates selected for thicker
Varnish outer 2 days

- | | | |
|-----|---------|--|
| 1 = | ⊙ thick | $\frac{1}{8}$ high in Center on back |
| 2 | " | $\frac{1}{8}$ " |
| 3 | " | $\frac{1}{8}$ " |
| 4 | " | $\frac{1}{8}$ - $\frac{1}{16}$ " |
| 5 | " | $\frac{1}{8}$ - 1 inch under a hole - plate |
| 6 | " | $\frac{1}{8}$ - 1 inch 2 $\frac{1}{2}$ from hole |
| 7 | " | $\frac{1}{8}$ - $\frac{1}{16}$ " |
| 8 | " | $\frac{1}{8}$ " has not $\frac{3}{8}$ of 2 days |
| 9 | " | $\frac{1}{8}$ $\frac{1}{16}$ - |
| 10 | " | $\frac{1}{8}$ - |
| 11 | " | $\frac{1}{8}$ - |
| 12 | " | $\frac{1}{8}$ - |

6 Transfers -

OK III

Crack  Corned 1

Steam pressure
was 108 lbs -

83% done

This looks good

Should try

| | |
|-----------|--------------------------|
| 10 men on | 600 lbs - 6 |
| 10 | 700 " not as good as 600 |
| 10 | 800 " not using good |

Probably best is
500 @ 600

18 Expt

10 min on 500 lbs -
free III

OK III III 9

May be OK II

Much better than the 7 min contract
only.

Prints 6

66%

OK IIII

Not filled in Center Music 1,
Cracked in label



They sound pretty good.
Mostly Velvet & only
I had run out to amount
to anything -

We now put the 4 that
has birds - Double
transfers

No 19

No 1 Schedule

3 Central 7 high 800

210 Degrees Fahr baked

Plates —

4 Free HT
Stick 1

OK II

Red Cauler

Birds both sides I
Birds one side III

35%

Wg on this schedule

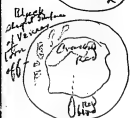
and do not really get
225 Fals - none welded

Dup with
25 lbs Steam pressure

Transfer - Free
Stick III



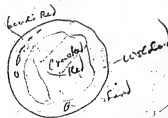
Red welded X



Bottom of press gets most
heat, but in fact better, less
heat

Others about same

1/2 to 1/4 around
hole, powder of
black welded
+ pulls off -



Partial
cleaning
top of V-weld

Specially picked flat plate
No 20 ⑩ even floor

Use only 5 to 8 lbs steam pressure

Warm up platen 5 min
before pulling in mould

5 min Contact

7 " 800 lbs -

Cool. only use
5 lbs steam -

New Machine Blank -

Reg Var -

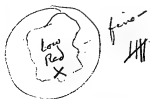
Transfer

Squinted + improved design 1 - } Blank
" + cracked blank + }

2" Long

Another just checked about 100 lbs steam
just under 100 lbs steam
dillo - The rim is plastic as it squinted
but 500 lbs don't pull blank in circular
I show lower contact at edge 1 @ 1/2 in
best value no contact rim left plastic
+ cracked cleats. Cond

Moore thinks on account of
low pressure we get back pressure
from other press



This is promising if we
can get X up & stop feed
will get good transfer
& no birds ~~two~~ 62 OK

~~We are thinking of
25 lbs run of 5
as well as the~~

Specially picked good plates
No 21 - (12) Even floor

New machine blanks Reg plates

7 min contact -
Then run up to 800 lbs
& then mount needle & rows
800 lbs go back to contact
& Cool - Free MH
quick

Transfer -

OK none not enough
fill at Centers & edges
OK fine -

Note for No 33

better than 22 for 33 work

No 1 - bind $\frac{1}{8} \times \frac{1}{8}$ $\frac{3}{4}$ from edge
points to center other side -
 $\frac{1}{4}$ red bind in place - $\frac{1}{4}$ from edge
Red Center - 4 @ $\frac{1}{4}$ in -

2 - bind $\frac{3}{8}$ in $\frac{1}{4}$ edge

3 $\frac{3}{32} \times \frac{1}{16}$ * $\frac{1}{2}$ edge
point towards and point towards
center lines - some cutters are small
binds - otherwise ok -

4 bind ∇ $\frac{3}{16} \times \frac{3}{32}$ points towards hole
but sharp end towards rim
other side ok -

Print -

OK All over 11 black

all filled. 1

crack in many ways 1

Red Center filled edges least
part missing not quite filled } 11

peculiarly is 2 edges
filled

No 22 Corn flow plates

7 Min Contact, then
run up to 800 lbs. the
moment the needles touch.
800 lbs cut off steam &
Cool keeping pressure at
800 lbs -

Use Machine made plates
& Reg transfer plates -
from M11
stick

OK - 1

Binds both sides - 1

Bind one side 1

This is less red than 21 but if
black 66 got perfect think
21 is better as there won't be
binds - all the diff between
21 & 22 is that 22 has less
red. it originally was 62 as 21
but longer pins reduced the area
but original defects there but covered

Dalleys Transfers
Baked $5\frac{1}{2}$ hours Reg.
Crown - 228 Feb.
768 made 615 OK -
153 discarded -
80%

Prints of 23 = 1st lot.

OK I

possibly Corral ~~comp. III~~
Doubt is chipping on Edging

Due to not quite facing
on extreme edge.

No 23. Even flow plates

3 min Contact Reg. glass from
7 " 800 lbs -

The plates used have been
used matte by Emory cloth -

Use Machine Mould Glasses
Free IIII
Stick I

OK III

Bind 3/4 from edge to round end. I

83%

Duplicate

Free IIII
Stick

OK - IIII

Bind one side I

Bind both sides I

66

average 74 1/2%

Transfers on hand - 089
 235 1430
 210 302
 160 208
 Reg Baked 200 134
 260 49
 Flowed 60 cc 35
 70 cc 190
 90 cc 51

~~730 - Dehydrated Resin 450° 100gms 159
 2 Para 4 penten 3 6/4 - 145 calcohol~~

~~731 - 100 gms Dehydrated 450° 142
 2 para 4 penten 3.5 6/4 145 al~~

~~732 100 Dehyd Resin 450° 167
 2 para 4 penten 4 6/4 145 cal~~

~~733 100 Dehyd Resin 450° 200
 2 para 4 penten 4.5 6/4 145 al~~

~~734 - 100 Dehy resin 450° 200
 2 para 4 penten 5 6/4 - 145 al~~

~~735 100 Dehy resin 157
 2 para 4 penten 5.5 6/4~~

165 ✕
736 100 Delby 480°
2 para 4 punta 6 6/4 - 145 al

724 Reg Resin - 100 - 221 - 213
2 para 7.4 6/4 4 punta 145 al

725 - 100 Resin 221 - 2 Para 4 punta
7 6/4 145 al
245

726 100 Resin 221 - 2 Para 6 punta
7 6/4 - 145 al - 198

737 100 Delby 480 26 ✕
2 para 12 Punta 5 6/4 145 -

722 - 100 Resin (206) - 14 phasal 34
7.9 6/4 - 2 Para 4 punta 145 al
1/4 Zinc Chl -

678 100 Resin 181 - 3.9 phasal 34 ✕
8.4 6/4 2 Para 10 Punta 145 al

741 - 100 Dehy 480 148 *
8 6/4 20 Petin 2 para
3 Dichloronaphthalene 146.5 al

742 1 gal Reg Var 20 gram 58
Phosphorus II

742 B 1 gal Reg V 189 gram
Phosphorus II

650 - 100 Res 191 23
2.9 phenol 7.9 6/4 2 para
4 Phthalimide 148.4 al

651 100 Res 191 22
2.9 phenol 8.5 6/4 2 para
4 Phthalimide - 148.4 al

652 100 Res 7.9 6/4 2 25-
para 2.9 phenol -
4 Phenylphthalimide 148.4 al

699-100 Ream 186

3.4 phenol 7.9 G/4 2 Para 26

1/2 penla 140 al - Viscosity
1 min 4 sec

~~699A Dump 699 except~~

~~130 gram al - Viscosity~~

~~16 min 44 sec~~

10

Note, the Even flow
plates - Rings can be
be seen $1\frac{1}{2}$ to $2\frac{1}{2}$ from
Edges - There is
diff of 003 -

Run -

This is called Even flow
plate but its not
its 25% thinner -

This yellow Edges we
noticed on print on
short, schedule 1000
lbs + due went heat
at contact & thick
plate not soft enough

No 24 Even flow plates

20 lbs steam -

7 min contact -
Run up to 1000 lbs for 1 minute
then back to contact -
Cool.

Stick 11
free

(Yellow Edges, some places $3/16$
- all around edge -
Note this - all have this -

Rad Centurs, & places nearly
to Edge running, Cracked bag
in Rad Centurs stuck to plate
in some cases where cracked
in rad Centurs -

Cools away from plate
Nolowithstand heavy low
temperature & stress

I have a blackhead
1 " now red bands $1/4$ from rim

$1/4$ " after weld Edge shows perfect
weld - Edge too high -

No 25-

10 Penta - 8.4% 6/4
Usz ~~678~~ Varnish Plates
678
3 min Contact
7 min 800 lbs - Co. S.P.
free HM

Birds both sides HM

Birds one side 1

Note Excess Penta needs
Birds,

12% Penta 5 6/4 was horrible
above with 10% Penta 6-7 8.4 6/4
is OK but for birds -

Duplicated
By mistake -
Ratten -

No 26

Use 737 Varnish plates

3 Min Contact

7 " 800 CGs -

Some streak

full birds and row around edge!
Terrible pull outs,

One worst sample saved.

About 1/2 of Var pulls off other
half stays at the row of
run pulls out. —

Ratten —

Not enough 6/4 + too
much Penta. —

27-

6 printed with $8\frac{1}{2}$ inch
Extra plate 10/1000 thick on top
of transfer -

3 Contact

7 min 800 lbs -

ng-

It looks as if birds
was due to low 6/4
Should have Delivered
and 8 to 9 6/4 & guess

28-

Delivd 3% 6/4 only
only change

730 Blanks -

3 Contact

7 min 500 lbs -

OK

Free
Steel
Shuckhand

Birds one side 1
" both sides -

Ratten - not
hardened - 6/4 too low -
Birds in big tank

WQ

Note 29- 4%
make them good

29-

Use 732 plates, new blanks
Bkly, 4 1/4 4 1/4 2 pairs of Pencil-

3 Contact

7 High - 800 lbs -

Very Hard Stack III

OK IIII

Bind and side 11-

PHENOMENON

66%

Print

OK-11

Not filled bathhouse 11

Not filled small crack 1

Edge of full

Edges cracks



30

Use 735 Delby 5.5% 6/4 -
new blank -

3 Contact
7 Hg at 800 lbs

Free III
Stick III

OK

Binds both sides III

Ving Card long row red
2 edges - 6 in 6 birds -

Curious 3% 6/4 - not hand
4% " hand + good
" but stick 6 in

5.5 Like 3% hand
but not stick 6 in

31

725 ~~blank~~ place
Delegated 7/6 6/4

3 Contact

4 Hough - 500 66 -

OK. none -

Free 11
Gleak IIII

Bird one side 1

Birds both sides IIII

Red ring birds at E Lgs. 1

Wg

Dehydrated
Resin seems
NG

32

726 plates 6 Paula Dehy Resin
7% 6/4 -

3 Centinel
7 1/2 inch 500

Stick - 11

Black Tear birds }
Yellow birds - } all bad
Edges birds long - }
Crushed or walked down

NG

1 was OK on 16.25

Red Centinel 1

Although more 6/4 the
Paula is greater
may be free placed -
infancy

Notes - the one print from expanded transfer
are Red nearly all gone - w/s suppresses -
20% no better for surface still Red

2 sheets came free of plates
in bringing them over
put them over a blank &
printed Record

Record OK faint to good.
surface NO RO's.

Dalley is trying make it
practical to chile off -
Dad cut on Replog

RO are short & sharp.

Surfaces -

| | | | | | |
|-----|--------|-------|--------|------|-----------------|
| 1 - | Land - | fair | good - | fair | |
| 2 - | " | " | " | " | Bad RO |
| 1 | " | good | good | | Stand P & RO |
| 2 | " | fair | good | | Bad RO's |
| 1 | " | faint | good | | S + M. (P & RO) |
| 2 | good | good | good | | Bad RO allows |
| 1 | good | good | fine | | S + M. (P & RO) |
| 2 | fair | good | fine | | S only (P & RO) |

The Varnish too then on
start squinted out too much in
transfer - makes Run out

We print at 3rd line, 2 heat 2 contact
+ 7 high 1000 lbs -
33. to stop red - Print no
better oil stops welding

Possibly beam prevents welding
Use 2 Dalley Sesame plates,
should be ok with up in Printing
also finished with being off

3 Contact.

7 High 800 lbs

OK M1

Free M1
Stick

all OK 100% -

Print =
OK. M1

100%

not quite filled at Edge on some -
Can fix this -

Notes on Transfers -
Good fill No Red Centers - squint
out Edge considerable - to Varnish

I have shade red centers -
Varnish squint at Edge 1/4" or more
Moore small - squint
too much disbalance to Varnish side RO

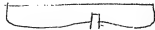
Where there is great squinting
of veneer, we get Run out
& thick —

Records

| Start | Mid | End | | | | |
|--------|------|------|-----------|----|-------|-------|
| 1 Low | fair | good | RO | RO | fault | x |
| 2 good | fair | good | no | RO | no | |
| 1 good | fair | good | no | no | no | |
| 2 good | good | good | Bad | RO | no | |
| 1 good | good | good | } — no RO | | | |
| 2 fair | good | good | | | | |
| 1 Low | Low | fair | — | RO | RO | fault |
| 2 " | fair | good | | RO | no | no |

Not near as bad RO
As 33 — didn't squint out
Like 33 —

34



4 New bowed scraper
No 21 Scraper —

Replates —
3 Contast

4 High 800.

OK II

Free II
Stuck I

One side Bind II

Red Centers, No Red Centers,
Edges look good —

50%

Print —

OK III —

100%

20k hrs count —

Evidently

No 35

Use Egg plates 16 mm. 44 sec
Viscosity Reg Valve

3 Contactor
y High - 800 Lbs -

Free
Stick IIII

OK

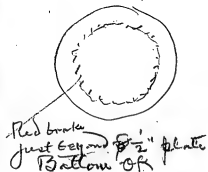
Bands both sides HMI
Bands one side.

Bad -

Phenomenon Even successful spots
show them both sides

Bad row at edge of red team 11 is.
Didn't fill - Red 11

Varsels must have ridges
to get such bad results,



36 —

$8\frac{1}{2}$ disc of steel
placed on top of
plate only —

3 Contact

4 High 800 lb

OK

free
click #111

Bottom OK where $8\frac{1}{2}$ plate, red circle #11
Bottom on one show bad side, ring,
of break — other side bad ring,

Side where $8\frac{1}{2}$ disc is is only
side that sticks to plate,,

No Red Centers —

37

Use 722 plates Reg
except $\frac{1}{4}$ InCL-

3 Contact

7 High 500 lbs

Free ~~100~~ 100
Click 1

Ridge of Greatest birds 62th and 111

One side ok and other 1

awful ring breaks out edge

~~Handwritten text, possibly "Handwritten"~~

Varnish not black

mg



38

742 B plates!
Reg-gal var- 189 grains
3 Contrast Phosphor
x 1/2 High 800

Fres!
Stuck!

~~Handwritten text, possibly "Bands of the..."~~

mg Experiment
is only to get
Vencor black & it
isnt



39-

650 plates 2 para 4 phthalimide
Req 6/4 Req V.

3 Contact

9 High 800

4 free IIII
Stuck II

OK 1

Bands one side 1
Bands both sides IIII

Bad Ring red band 2 lge II

Print

OK - II

Crushed starting unlabeled gun to mass 1
Red centers III not filled in mass 10 not Labeled III

All filled

The surfaces are poor at Edges
+ very good at Center
where red + not filled.

40

Req plates, Use bow scrapers
blanks

7 min Contact

then run up to 800 lbs
the moment needle shows 800 lbs
go back to contact + Cool.

OK IIII

Free III
shrink - 1

Crushed in Red Center outside 1

Large Red Centers in all -

Cooked Centers bad

Great amount of gas or
Vapor undulated the
red cent

Print,

OK 11

Red Spatting on smooth Edge 1
Red unfill both sides in minor 11

Red seen in Center
~~Red up~~

Edges were filled no cracks

Printed - 2 Heat
2 Central
7 High -

Still Red, surface
fair some RO -

no 41

Req plates - Bowd Scaper blanks

7 minutes Contact. then
run up to 1000 lbs the
moment needle shows
1000 lbs go back to
Contact kind cool

OK 111

Free 111

Red Center,
Looks not so bad as 40 a
considerable improvement but still
Yellow edges - cranked

This schedule may be
good for Reg transfers,
on new blank ^{or 44 45 46} ~~44~~ Best
Dallys is bad, I has very
bad ship run out,

42

33-Dally Sm plates. Bowed blanks if possible —

10 min on 500 lbs —

Free 11

OK 11 —

Wine 11 —

squared normal, but some is crinkled
yellow apart transparent. Think
Veneer been strained a bit a RO.

Print, Wash Bengal before Print
2 heat
2 Contact
7 1000
Cool

OK 11 — Dallys RO not good
one reg transfer good and
no RO —

X043

2 plates of 33 on one new block

1 plate of 33 on one side Regular only

7 minutes at 500 lbs
Coal

This is pretty good

Think perhaps
500 is best.

44

Reg plates, new blanks -

10 minutes on 600 lbs Coal

OK 111

7/12 111
Think 11

Red spot both sides had blank 11
luck full both side same - 11
No Red 11

Print,
OK 11

RO weak only 3 or 4
have any

Red center -

Cranked edge 11

not full both side edge 11

If blank were good
dec would be OK -

Not near as good
as 44 -
which is pretty good

45

Req plates new blanks

10 min on 700 LB

Free III
Blank - 1

OK. III.1

Pretty good transfers -

Trace red II
Black imp 1

Print -

OK II

not filed

Black centers II

not filed next label I

If blanks were good all would be OK

Considerable

RO - not shown small

Not

III

800 is too much
5 6 or 700 lbs best

46

Req plates new 6 each
10 min on 800 lbs

Free III
Strike - II

OK IIII

Birds - 1
Bird center dish 1
Bird both sides 1

Red center both sides 1

Reprints out much, some crushed
yellow 1

No Print

47

Reg plates New blanks -

10 min 800 lbs -

drop back to 500 lbs
& Cool.

OK //

Time //

Stuck - /

Bird - 1 on side

Small " - 1 on side

" - 1 on side

" " 1 on side

400 lbs is not enough
to fill + prevent cooking
+ weld

Wants 500 to 600 lbs

Prints - OK III

Cracked 1.

83%

Red Center front II
" " string I

Cracked both sides near label I

Blight Crack near gm

Edges look good

48

6-
@ Transfers - Reg plates
new blanks -

10 Minutes at 400 lbs
Cool

Print 2 heat 2 Contact 3 at 1000 Cool

OK III

Free
will Easy
Stick III

No Bend

Red Center, not quite full III
both sides Cooked III

Evidently Matte plates prevents birds to a great extent.

Moore is picking out 500 Matte plates to flow & we will use these in these experiments as soon as we get them

because 10 min at 500 has twice been free of birds - but this lot has birds & the plates are exceptionally bright

Prints, OK III
5. =

One transfer was discarded

bed in front center |

dry crack at center & crack at margin |

49 -

12 Transfers Reg plates
new blanks -

10 min at 500 lbs
Cool

Print 2 heat 2 contact 3 at 1000 lbs

Free H₂O
stick

OK II

Bound one side II
Row and birds Edge (bad) |
Cooked both sides - |

The plates are very bright polished that have birds on. The Matte plates no birds - CO₂ are up against Synthesis, Ws

4 Mattes OK
1 Bright OK

1 Moderate Matte Bad
3 Matte Bad
3 Pale Matte Bad

4 Bright 1 good 3 bad 25% good
7 Mod Matte - Matte, 4 good 57% good

50

12 Transfers - Reg plates new
Blanks -

10 minutes at 600 lbs
Cool.

Print 2 heat 2 Contact, 3 at 1000 lb

1 Bright plate no red OK
2 Matte " " OK } OK

1 - Matte - slight red OK
2 Mod Bright " " B. -

1 Mod Matte " B. -
2 Matte " B. -

1 Matte " OK } OK
2 Moderate Matte " OK

1 Pale - " 2 Birds -
2 Matte " Bad very red draw

1 Matte Red 1 fine bird -
2 Bright " 2 Birds big -

Free IIII
Stuck Easy
Slick -

1 Matte } OK

2 " }

1 Med Bright } OK

2 " }

1 Matte } OK

2 " }

1 Bright } OK

2 High Paleol } OK

1 Matte } OK

2 Matte }

1 Bright } OK

2 " }

1 Bright } OK

2 Matte }

1 Bright } OK

2 Matte }

1 Matte } OK

2 Matte }

1 Paleol } OK

2 Bright }

1 Med Bright } OK

2 Bright }

1 Matte } OK

2 Matte }

1 Matte } OK

2 Matte }

830/0

four red

four red
By red

1" at hole Red

Not as good as 51-

Wants lower pressure
longer heat,

52

12 Transfers Reg plates New Blends

10 min 600 lbs - Caap.

Dup of 50 - Lot 1565 Var 632

All very free - Free HHT HHT
3 inch

1 - Mat } OK black

2 Bright } OK

1 Mat } OK

2 Mid Mat } OK

1 Mat } OK

2 Mat } OK

1 Mat } OK

2 Bright } OK

1 Mat } OK

2 Bright } OK

1 Mat } OK

2 Mat } OK

1 Mat } OK

2 Bright } OK

92%

Free all
Not one stick

Slite Red Center

Red ring

Red ring

Red ring

Red ring

Black ring

Cooked ring red

Red ring -

1/2 red ring

Red ring

faint Red ring

Print 11 - one saved to correct ring

54 =

12 Transfers - Use Bowed
Scraper blades - Rec plates

15 min at 500 lbs Cool

Print 2 heat 2 Control 3 at 1000 lb

| | | | | |
|----------|----|----|----|------------|
| 1 good | no | no | no | |
| 2 " | vv | vv | no | |
| 3 good | vv | vv | no | |
| 4 good | vv | vv | no | 67 |
| 5 good | vv | vv | no | cooked |
| 6 good | vv | vv | no | not fill - |
| 7 good | vv | vv | no | |
| 8 good | vv | vv | no | |
| 9 good | vv | vv | no | |
| 10 good | vv | vv | no | |
| 11 good | vv | vv | no | |
| 12 good | vv | vv | no | |
| 13 good | vv | vv | no | |
| 14 good | vv | vv | no | |
| 15 good | vv | vv | no | |
| 16 good | vv | vv | no | |
| 17 good | vv | vv | no | |
| 18 good | vv | vv | no | |
| 19 good | vv | vv | no | |
| 20 good | vv | vv | no | |
| 21 good | vv | vv | no | |
| 22 good | vv | vv | no | |
| 23 good | vv | vv | no | |
| 24 good | vv | vv | no | |
| 25 good | vv | vv | no | |
| 26 good | vv | vv | no | |
| 27 good | vv | vv | no | |
| 28 good | vv | vv | no | |
| 29 good | vv | vv | no | |
| 30 good | vv | vv | no | |
| 31 good | vv | vv | no | |
| 32 good | vv | vv | no | |
| 33 good | vv | vv | no | |
| 34 good | vv | vv | no | |
| 35 good | vv | vv | no | |
| 36 good | vv | vv | no | |
| 37 good | vv | vv | no | |
| 38 good | vv | vv | no | |
| 39 good | vv | vv | no | |
| 40 good | vv | vv | no | |
| 41 good | vv | vv | no | |
| 42 good | vv | vv | no | |
| 43 good | vv | vv | no | |
| 44 good | vv | vv | no | |
| 45 good | vv | vv | no | |
| 46 good | vv | vv | no | |
| 47 good | vv | vv | no | |
| 48 good | vv | vv | no | |
| 49 good | vv | vv | no | |
| 50 good | vv | vv | no | |
| 51 good | vv | vv | no | |
| 52 good | vv | vv | no | |
| 53 good | vv | vv | no | |
| 54 good | vv | vv | no | |
| 55 good | vv | vv | no | |
| 56 good | vv | vv | no | |
| 57 good | vv | vv | no | |
| 58 good | vv | vv | no | |
| 59 good | vv | vv | no | |
| 60 good | vv | vv | no | |
| 61 good | vv | vv | no | |
| 62 good | vv | vv | no | |
| 63 good | vv | vv | no | |
| 64 good | vv | vv | no | |
| 65 good | vv | vv | no | |
| 66 good | vv | vv | no | |
| 67 good | vv | vv | no | |
| 68 good | vv | vv | no | |
| 69 good | vv | vv | no | |
| 70 good | vv | vv | no | |
| 71 good | vv | vv | no | |
| 72 good | vv | vv | no | |
| 73 good | vv | vv | no | |
| 74 good | vv | vv | no | |
| 75 good | vv | vv | no | |
| 76 good | vv | vv | no | |
| 77 good | vv | vv | no | |
| 78 good | vv | vv | no | |
| 79 good | vv | vv | no | |
| 80 good | vv | vv | no | |
| 81 good | vv | vv | no | |
| 82 good | vv | vv | no | |
| 83 good | vv | vv | no | |
| 84 good | vv | vv | no | |
| 85 good | vv | vv | no | |
| 86 good | vv | vv | no | |
| 87 good | vv | vv | no | |
| 88 good | vv | vv | no | |
| 89 good | vv | vv | no | |
| 90 good | vv | vv | no | |
| 91 good | vv | vv | no | |
| 92 good | vv | vv | no | |
| 93 good | vv | vv | no | |
| 94 good | vv | vv | no | |
| 95 good | vv | vv | no | |
| 96 good | vv | vv | no | |
| 97 good | vv | vv | no | |
| 98 good | vv | vv | no | |
| 99 good | vv | vv | no | |
| 100 good | vv | vv | no | |

Prints
OK IIII

Eng Mat fill 11
Mat fill 11

40%

9 no

5

22

1 - Mat } OK
2 - Mat }

1 Mat } OK
2 Mat }

1 Mat } OK
2 Mat }

1 Mat } OK
2 Bright }

1 Bright } OK
2 Mat }

1 Mat } OK
2 Mat }

1 med mat } OK
2 "

1 Mat } OK
2 med mat }

1 Mat } OK
2 Bright }

1 Mat } OK
2 Bright }

1 Bright } OK
2 Mat }

1 Mat } OK
2 Mat }

slight red } 75% - 100%
stuck 11

slight red ring

faint red

slight red

slightly red

slightly red

slight red

Red over all

100%

Note Prints, Louder than 51 54
but less RO -

Moorz for present this is
55 our transfers &
Printing schedules -

12 Transfers - Reg plates
~~55~~ New blanks

15 minutes at 500 lbs - Cool
Don't fall any below 500 or
go more than 20 lbs above
500 -

Print 2 heat
3 Contact.

5 min 1800 -

Note 5 min instead of usual 3.

| Time | no | no | no | 1 good | no | RO | no |
|-------|-----|-----|-----|--------|----|----|----|
| 1 min | Red | Red | Red | 2 " | no | Y | no |
| 2 " | Red | Red | Red | 2 " | no | Y | no |
| 3 " | no | no | no | 2 good | no | Y | no |
| 4 " | no | no | no | 2 good | no | Y | no |
| 5 " | no | no | no | 2 good | no | Y | no |
| 6 " | no | no | no | 2 good | no | Y | no |
| 7 " | no | no | no | 2 good | no | Y | no |
| 8 " | no | no | no | 2 good | no | Y | no |
| 9 " | no | no | no | 2 good | no | Y | no |
| 10 " | no | no | no | 2 good | no | Y | no |
| 11 " | no | no | no | 2 good | no | Y | no |
| 12 " | no | no | no | 2 good | no | Y | no |
| 13 " | no | no | no | 2 good | no | Y | no |
| 14 " | no | no | no | 2 good | no | Y | no |
| 15 " | no | no | no | 2 good | no | Y | no |
| 16 " | no | no | no | 2 good | no | Y | no |
| 17 " | no | no | no | 2 good | no | Y | no |
| 18 " | no | no | no | 2 good | no | Y | no |
| 19 " | no | no | no | 2 good | no | Y | no |
| 20 " | no | no | no | 2 good | no | Y | no |

Print
OK 100% 11

100%

14 no 13 no 11 no

Evidently time will not
 Give too long a process

1- } Cornel filled w/ red Cakes

1/2 } NG Egan free w/ red, Cooked

1/2 } NG Cooked Cakes Egan filled OK

1/2 Cakes OK Mangan not filled (both OK)

1/2 Cornel - Cakes OK Mangan not filled

1/2 - OK - Cakes red - Mangan filled

1/2 NG - Cooked Cakes Mangan not filled

1/2 NG Not filled Cakes Mangan OK

1/2 NG Cooked Cakes, Run filled

1/2 OK

1/2 Cooked Cakes Mangan not filled

1-2 "

"

"

57

Use reg plates + Machine blanks

20 min at 400 lbs - Cool

Don't let it go below 400 lbs
 or above 410 lbs -

Print 2 heat
 2 Control
 3 High 1000 lbs -

1 } OK Transfers Red

1/2 } OK but Low Cooked Cakes

OK " " "

OK " " "

OK " " "

OK Red Cakes -

1/2 Cooked Cakes

(Round) Red 3/4" cracked

Cooked

Cooked Cakes

Red Cakes

Dark Red Cakes

Dark Red Spot

9 1/2%

NO 22 Scaper

is



Dont get rid of Red
Rings -

| | | | | | |
|---|-----------|------|------|------|-------------|
| 1 | quod | Ro | faut | no | |
| 2 | quod | Ro | " | no | |
| 1 | quod | Ro | no | no | |
| 2 | quod | Ro | no | no | no 4 and 10 |
| 1 | faut | Ro | faut | no | |
| 2 | quod | Y | Y | no | |
| 1 | quod | no | no | no | |
| 2 | faut | Ro | no | no | rungs |
| 1 | quod | Ro | Ro | no | |
| 2 | quod | no | no | no | |
| 1 | f.to quod | Ro | faut | no | |
| 2 | quod | faut | faut | no | |
| 1 | quod | Ro | Ro | no | |
| 2 | quod | Ro | Ro | no | |
| 1 | faut | Ro | ✓ | no | |
| 2 | faut | Ro | faut | faut | |
| 1 | f.to quod | Ro | faut | faut | |
| 2 | Y quod | faut | faut | VVVV | 67 |
| 1 | quod | faut | faut | no | |
| 2 | quod | Ro | " | no | 47 |
| 1 | quod | Ro | faut | VVVV | |
| 2 | faut | Ro | " | no | |
| 1 | faut | Ro | Ro | no | |
| 2 | f.to quod | Ro | faut | no | |

3 no 5- 21

58

Use 70 cc plates ⁶³² New blanks

15 minutes at 500 lbs - Cool.

Print 2 heat 2 Contact 5 min 1000 lbs

$\frac{1}{2}$ } ok. Black back full growth

1/2 } OK
1 } OK

2 } OK
1 } OK

1 } OK
2 } Bright - Boards 2

2 } GR
matte Bernd 1. re

2 } ok
1 }
2 } ok

12 } OK found red knothole

1/2 jok

2 } OK Hunt red house file

81%

Free!!!
Stuck!!!

| | | | | | |
|---|--------------|------|------|------|----|
| 1 | dump good | Ro | Ro | no | |
| 2 | land - | Bad | Bad | Ro | 67 |
| 1 | fair | Ro | Bad | no | |
| 2 | fair | fair | fair | no | |
| 1 | land - | Bad | Bad | Ro | |
| 2 | fair to good | Ro | fair | no | |
| 1 | fair | Bad | fair | no | |
| 2 | fair - | Ro | Ro | no | |
| 1 | land | VV | V | no | |
| 2 | good | VV | VV | no | |
| 1 | fair | V | fair | no | |
| 2 | fair | Ro | Ro | fair | |
| 1 | land | Ro | Ro | VV | |
| 2 | land | Bad | Bad | VV | |
| 1 | land | f | fair | no | |
| 2 | f to good | Ro | " | no | |
| 1 | land | V | V | no | |
| 2 | f to good | Ro | no | no | |
| 1 | fair to | Ro | fair | no | |
| 2 | land | Ro | " | no | |
| 1 | land | Ro | Ro | no | |
| 2 | V to good | no | no | no | |
| 1 | good | no | V | no | 67 |
| 2 | fair to | V | V | no | |

2 3 19

59-

Wax plates baked 260 types new blanks

15 min at 500 lbs - cool
don't fall below 500 or above
510 -

Print 2 heat 2 Contact 5 100065
big yellow covered 3/16 2 gnat

1. OK -

2. OK

3 OK

4 OK

5. OK

6 OK

7 OK

8 mg

9 NG

10 NG

11 OK

17. OK

Not filled - vsd Canein

faunt red, not quite full

Cooked

Cooked

Cooked

ificant re

45%

Free HH HH
stick II

A Crunch due to hummer
the mechanical don't do it

| | | | |
|--------------|-----------|--------|------|
| 1 good | fant | fant | no |
| 2 good | " | " | no |
| 1 good | V | V | no |
| 2 good | V | V | no |
| 1 good | V | V | no |
| 2 good | V | V | no |
| 1 good | VV | VV | none |
| 2 good | Crunch | Crunch | no |
| 1 good | VV | VV | V |
| 2 good | VV | VV | no |
| 1 good | no | VV | no |
| 2 faint good | Ro | Rd | no |
| 1 good | Ro | Ro | no |
| 2 faint good | Rd | fant | fant |
| 1 good | V | V | no |
| 2 V good | Rd crunch | V | no |
| 1 good | no | no | no |
| 2 faint good | Ro thup | fant | no |
| 1 good | VV | no | no |
| 2 good | no | Ro | no |
| 1 good | fant | fant | no |
| 2 good | Ro | Ro | no |
| 1 good | Bad | no | fant |
| 2 good | fant | no | no |

Middle. Ro caused by red + black same time

The surface are 1/2 the London
of 56 old regular
but not velvet except end of
Recond - White better black
surface -

60

Use plates baked 210 deg New Black
15 min 500 lbs - Cool
don't fall below 500 lbs or
go above 510 -

Print 2 heat 2 Control 5 1000 lbs

- 1 = OK
- 2 Cornel
- 3 OK
- 4 OK
- 5 OK
- 6 OK
- 7 OK
- 8 Cornel
- 9 shiny - Bird NG
- 10 OK
- 11 OK
- 12 OK -

Red Center
Cooked

Red Center
Slightly Cooked
" Cooked

faint red
"
"

92%

Frz IIII
Stack IIII

61

Use plates baked at 200 deg -
New blanks

15 min 500 lbs - Cool -
Don't go above 510

Print 2 2 + 5 at 1000 lbs

| | | |
|--------------------------|---------|----------------------|
| $\frac{1}{2}$ } OK | } Camel | |
| $\frac{1}{2}$ } 1/2 bird | | |
| $\frac{1}{2}$ } NG | | Cooked Center |
| 1-2 - Camel | | Almost cooked center |
| 1-2 NG | | Cooked Center - |
| 1-2 OK | | Squash out to yellow |
| 1-2 OK | | |
| 1-2 OK | | 1 block backfill |
| $\frac{1}{2}$ } OK | | |
| $\frac{1}{2}$ } 1/2 bird | | 2.6 and NG |
| $\frac{1}{2}$ } Camel - | | Cooked Center |
| OK | | Red Center |
| OK Camel - | | Cooked |
| OK - | | Red backfill - |

75 OK + Camel

Free M.H.H.

Shut down
Shut off

2=

| | | | | | |
|---|--------|------|------|------|----|
| 1 | Land | RO | no | no | |
| 2 | good | no | no | no | |
| 1 | fair | Bad | Bad | no | 67 |
| 2 | good | Bad | Bad | no | |
| 1 | Land | RO | no | no | 67 |
| 2 | good | no | fair | no | |
| 1 | good | RO | RO | no | |
| 2 | Land - | Bad | Bad | no | |
| 1 | Land | Bad | Bad | no | |
| 2 | fair - | Bad | Bad | fair | |
| 1 | good | V | V | VV | |
| 2 | fair | Bad | RO | V | |
| 1 | fair | Bad | RO | V | |
| 2 | Land | Bad | Bad | V | |
| 1 | fair | RO | RO | V | |
| 2 | good | V | Land | no | |
| 1 | fair | Bad | no | no | |
| 2 | fair | Land | RO | no | |
| 1 | Land | no | no | no | |
| 2 | good | no | no | no | 67 |

Land 6
fair 6
fair 1
good 1
Bad 8
fair 2
no 2

Normal subphase rather
Land + RO rather bad -

With good new blanks
this process can be made
successful -

62

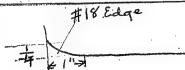
Print 12 Records with
the loose veneer -

3 heat
2 Contact
7 minutes at 1000 -

| Reheating in Chem. room | | Fin | Cont | Cont |
|-------------------------|------|-----|------|------|
| | | RO | RO | RO |
| 1 | good | RO | RO | no |
| 2 | fair | RO | RO | no |
| 1 | fair | RO | RO | no |
| 2 | good | RO | RO | no |
| 1 | good | RO | RO | no |
| 2 | good | RO | RO | no |
| 1 | fine | V | V | no |
| 2 | fine | V | V | no |
| 1 | fine | no | no | no |
| 2 | fine | no | no | no |
| 1 | good | no | no | no |
| 2 | fine | V | no | no |

new repack

67



rather loud surface on Ennis head
 due to its running over
 100 Res & a 20% louder
 repeated

Tested on Ennis speaker at first
 no reply 20% louder than in
 Chem room speakers -

* tested in Chem room again -

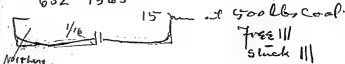
- 1 good
- 2 fine
- 1 fine
- 2 fine
- 1 good
- 2 good

No Run outs on
 any
 all Velvet, -

just one good final better than
 Standard Double Transpo
 model -

23 Scraper 55 Schedule -

632 1565 -



- 1 OK
- 2 OK
- 3 OK
- 4 NG -
- 5 OK
- 6 OK
- 7 OK.

15 in at 500 lbs coal.
 Free III
 Stick III
 Hunt Red Center
 " Red Center
 " "
 Cooked too much.
 Red runny
 Light red color
 "

92%

Print - 2 heat 2 Control 5 way

| | | | | |
|---|------|------|------|----|
| 1 | fang | no | no | no |
| 2 | good | no | no | no |
| 1 | good | RO | fant | no |
| 2 | good | no | no | no |
| 1 | good | V | no | no |
| 2 | good | fant | V | no |

fair for RO, + surfaces -

Skinner not changed shape — 55.4 g

55 Schedule

18 Scraper

16 covered in mould

Transfers not Expedited

Took 25 men to pack it -

Print Transfer

1 = filled on margin - faint red color

2

3 12 11

| | | | | | |
|-------|---|------------|------|----|-------|
| front | 1 | quand | V | V | no |
| | 2 | f to quand | RO | RO | no |
| | 1 | " " | V | V | no |
| | 2 | quand | fant | V | no 67 |
| | 1 | quand | VV | V | no |
| | 2 | quand | RO | RO | VV |

55 schedule

Reg scraper cut

lowers $\frac{1}{16}$ by lowener
rotating shaft - stick 1

OK-

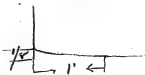
OK

OK sh to be 5' 7"

slightly 12" + even 5"

no improvement

63 -



Newspaper
NO 24 -

Yellow Edging

1 OK - V front row

2 OK - V "

3 Row 22 bunch at Edge NG.
24 bunch on other side.

Tree 11

Stuck 1

Print -

Print, Inspection

- 1 OK
- 2 OK okayed red label
- 3 OK
- 4 OK
- 5 NG Red Spot near not fill
- 6 OK

7 OK
8 NG okayed red
9 OK
3 were Cooked
+ known out

| Surface | RO | front |
|-------------|----------|-------|
| 1 good | V | front |
| 2 good | backfill | none |
| 1 fine | " | none |
| 2 fine | V RO | VVVV |
| 1 fine | front | front |
| 2 fine | no | no |
| 1 very fine | RO | no |
| 2 very fine | front | no |
| 1 good | RO | V no |
| 2 good | front | VVV |
| 1 good | RO | RO |
| 2 good | front | front |

434 is old dots

Deep

Surfaces very soft like cellulose
on a double transfer

Below air cushion non anchoring
will disintegrate thicker oil as it
anchors in places

Expt 64

55 schedule

Dry Experiment put sesame on



small units to have some
but none on label
on veneer as well only
around label
smooth part of
Run

Then playing of music
will have no contact
with blank - an air cushion

- 1 + Doubtful Cooked both sides
- 2 OK Red on 1/2 label
- 3 OK both sides
- 4 OK Red front on music
- 5 ~~OK~~ Cooked 1 side other side 3x3 mm edge Red
- 6 OK front red on music
- 7 Cooked other side long lift
- 8 OK Red in music
- 9 OK Red on music
- 10 OK Red on music
- 11 Cooked - Cracked Red on music
- 12 OK Red on music

65

12 new blanks. Rubbed
hard on both faces by dump of
graphite or lead pencil ~~so~~
so all holes disappear
being filled with graphite

55 Schedule Transfer +
print —

66

12 Transfers

Straight Scrapes on
Reg Jar Machine

15 min at 500 LB

Print 2 head 2 Control 5 1000

Last night we tasked some
55 schedule transfer point -
in Ernie's room with his speakers
all were very loud & bad RO
we were scared -

This morning brot Ernie's
speaker to Chem room - tested
it against our reg here -
found it 20% louder -

Also retested some 55 schedules
found Surface & RO good
most of them better than
surface of our standard
Double transfer record -
Afterwards found trouble
in Ernie's main which was
probably running over
100 Rev - so RO & surface
are good -

Also found many second
Cut that did not last
night in Ernie's room

4

Think Double Transfer
would be OK if not blank,
was flat & some density
But Edges weld on 1st transfer
+ stuff Cant Cook out,

67

Take 6 55 Schedule
Transfers & put another
transfer over them using
55 Schedule transfers & print

Double Transfers -

- 1 - "Good" Cooked on 2nd Transfer
- 2 - Cracked on 2nd - Red both sides
- 3 - Cooked on 2nd transfer - Red both sides
- 4 - Cooked on 2nd " Red Cracks both sides
- 5 - Cooked, both sides Cracks 1 side Second Transfer
- 6 - "wonder" - NG
- 7 - Cracked both sides big red only on 2nd transfer
- 8 - Cooked - both sides - only 2nd transfer
- 9 - Cracked, Cooked both sides big red only 2nd T
- 10 - Cooked both sides, big red only 2nd Transfer
- 11 - Cracked " " " "
- 12 - Cooked " " " "

This 55 schedule does not
make a double transfer on
New blank to a failure
Most of red in center

Miller Tracked blank hot & Cold
last night on Ennies Spks & over 100
Res. Mac sounded like a 60-day
yard & very bad run out due to
loose 100 appt. must noticed at the time.
Next day a new print tested in
Chem room showed pretty good
surface & some RO

This pm printed on ^{Reg Green} Double
Transfer show very fine salt
residue only VVY just RO
both sides

The Master is Evidently OK as
far as general surface is
concerned & perfectly
Satisfactory

69-

Use Miller Warm & cold blank
in printing Use new blanks
transferred on 55 Schedule

15 min 500 Lbs - Cool
Print 2 heat 2 contact 5 1000 Lbs

Double Transfer is slightly
better than 69- & has less
Run out but there is not
a very great difference &
if we had a good blank & got
rid RO think the difference
would be quite small

Must get smooth surface
& even blanks to equal the
Reg Dou Transfer

Print = Marked I for Cooked - doubtful -

Marked I for Cooked - doubtful -

70

Blanks made by special schedule
3 min contact 7 min 1000 lbs -
Used 18 scraper —

Transfer 55 Schedule

15 mm 500 lbs -

Don't fall in below 500 or go
above 520 - 632 Van 1567

Free all -

Print 2 heat 3 Contact 5 1000 LB
Transfers -

ok-

OK

JK
Doubleful -

OK

Storabulfr
Finnli

Cracked -
all

6/12

5/12

OK

OK
sk

.. 0.45

Big red center

Cooked with sides
B. & Red Caudy

Cooking Center

Red Center

ful - - - - -

unf. 11

11

no good in the

Extra time did no good in this case.

New Machine blanks
55 Schedule T + Print

Weak musical records -
a test -

1 = Instrumental Kathleen Monaghan
full of knocks + scratches - general
surface ok - a should have new
one - Much improved after washing
with 1/2 the knocks -

2 Sweet spirit has prayer instrumental
start horrible noise
knocks all them in my 3 or 4
together - lots knocks -
after washing start is very
much better - whole record
is better - that so bad -
RO at start

73

doz blanks made in Machine)
all the powder being screened
thru 180 mesh -

Transfer 15mm 500 lbs -
Print 2 heat 2 Central 5 1000 lbs

74
Duplicate of 64 Ept -

Daily make tools to do quick &
good job with Sesani - but want
little more on -

Transfers inspected -

1 OK Cook - Red over whole label wrong

2 OK Red on label red some more

3 NG Cooked cracker

4

5

6

No use -

7

8

9

Black $2\frac{1}{2}$ from Edges
inward

10

11

12

Don't do the egg

N.G

No print

Print - Inspection -

1 OK.
2 OK.
3 OK.
4 OK.
5 OK.
6 OK.

little upfil on margin
no ne
Black
"

7 OK
8 OK
9 OK
10 OK
11 Cooked

Black
Vigilant no
Black
weak print

| | | | | |
|---|--------|------|------|------------|
| 1 | good | no | no | weak Print |
| 2 | good | fant | fant | |
| 1 | good | no | no | |
| 2 | " | RO | RO | |
| 1 | good | fant | fant | |
| 2 | good | " | no | |
| 1 | good | V | no | |
| 2 | good | VVV | no | |
| 1 | good | fant | no | |
| 2 | good | VO | V | |
| 1 | good | VV | no | |
| 2 | good | no | no | 67 |
| 1 | fant | no | no | 434 |
| 2 | fant | no | no | 13 |
| 1 | good | VVVV | no | |
| 2 | good | VVVV | no | |
| 1 | V good | RO | RO | |
| 2 | good | no | no | |
| 1 | good | no | no | |
| 2 | good | fant | V | |
| 1 | good | RO | VVVV | |
| 2 | good | | | |

75-

25 Scraper -

15 min

500 lbs Cool.

Print 2 heat 3 Contact 5 1000 lbs -

Transfers. = They had a black Edge
3/8 to 1/2" wide

1 OK

2 OK

3 OK

4 OK

5 OK

6 OK

7 OK

8 OK

9 OK

10 OK

11 OK

12 -

Little Cooked Cool

Cooked up to split.



probably
best form
see 76

Print will show of Edges flk

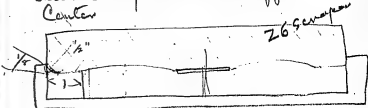
83%

Woods - made us a preliminary test 3 records - used
as 76 - They are all ok & fine - more records -

| | | | | |
|---|-----------|---------|------|-------------------|
| 1 | fast good | VV | no | Red cedar |
| 2 | good | | no | |
| 1 | fast good | no fast | no | fast |
| 2 | fast good | RO | fast | 67- |
| 1 | good | VV | no | |
| 2 | good | | no | |
| 1 | fast | no | no | |
| 2 | fast | | no | |
| 1 | good | RVV | no | the spot not full |
| 2 | good | VRO | V | Red one and |
| 1 | good | fast | no | |
| 2 | good | no | RO | leaf red spot |
| 1 | good | RO | | |
| 2 | V fast | fast | fast | |
| 1 | good | no | no | |
| 2 | good | VVV | VVV | |
| 1 | good | no | no | |
| 2 | good | no fast | VV | |
| 1 | good | no | no | |
| 2 | good | fast | V | |
| 1 | good | fast | VV | |
| 2 | good | no | no | |
| 1 | fast | V | no | |
| 2 | V good | no | no | |

76

Reg plates, new blanks made with straight scraper, bowed inward to put more stuff in center



15 min 500 Lbs - Cool

Print 2 heat 3. Contract 5 1000 lbs
~~Impressos~~ 10 pk 2 Crooked - dark red wing

Print inspection:

- 1 OK *Morone chrysops* - very dark red
 2 OK " " " only a red spot
 3 OK " " " large spot
 4 Distorted - uninfilled after and inner -
 5 OK filled no red
 6 OK filled " "
 7 NG Cooked Cantini. - probably due to being scraped
 8 OK filled - Red placed
 9 NG young spot in inner - not filled
 10 OK filled small very dark red
 11 OK " Red
 12 OK " Red Cantini was lobed but fruit lobes OK

Note - WE washed
the records in soap &
water - then they no
longer cut S S

74

Stripped Veneers printed directly
on new blanks # 18 -
3 min heat
2 Centalast
10 qt 600 lbs -

| | | | |
|----------|----------|----------|-----------------|
| 1 good | front | no front | |
| 2 good | " | | |
| 1 Cuts - | — | — | Cooked + stored |
| 1 good | ✓ | no | new water in |
| 2 good | ✓ | no | |
| 1 good | no front | no | Cuts little |
| 2 good | no front | no | Cuts little |
| 1 good | no front | no | |
| 2 good | no | no | |
| 1 good | no | no | |
| 2 good | no | no | |

Moore says they buff transfer
as stuff cooks out & caused
Cuts - Can't do it with this -
probably a solvent takes much
off.

This Veneer process is
Very promising & certainly can be
made a success.

- 1 NG not filled 1" dia in mass
- 2 NG Bodfill near label
- 3 NG Cooked Center
- 4 Cornel - red label
- 5 OK
- 6 OK

no use going thru this
NG,

To get flatter blank bath
bought heat & pressure wanted
etc in 79°

#78

- 12 New Blanks 18 Scrapers
- 3 min Contact 5 min at
2000 lbs

55 Schedule on transfer

15 min 500 lbs Coal

632 Van 1570

Print 2 heat 3 Contact
5 min 1000 lbs - "

Transfer inspection

- | | | |
|---------------|----------------------|---|
| 1 OK | still sug and Center | |
| 2 OK | " | " |
| 3 OK | " | " |
| 4 OK | " | " <u>still full core</u> <u>near 2 hrs</u> |
| 5 OK | " | " |
| 6 OK | " | " almost Cook |
| 7 OK | " | " Cooked |
| 8 OK | " | " |
| 9 OK | " | " |
| 10 OK | " | " Cooked |
| " Cracked - " | " | " |
| 12 OK | " | " |

Evidently no amount of high pressure will
convert this into even 7/19 peroxide blank.

Prints ~~7~~ 7

| | | | |
|-------------|----------|-------|--|
| 1 good | no | no | Discontinued RD |
| 2 good | Ro | VV | |
| 1 good | V faint | VV | Good 13 |
| 2 good | faint | no | |
| 1 good | no | no | Very Good 2 |
| 2 V good | no | no | |
| 1 fine | no | no | FINE 7 |
| 2 fine | no | no | |
| 1 good | no | no | No Runouts 13 |
| 2 Very fine | no | no | |
| 1 fine | VV | no | VV faint 1 |
| 2 fine | no | no | |
| 1 good | V | no | faint 3 |
| 2 V fine | no | VV | |
| 1 good | no faint | faint | Runouts 2 |
| 2 good | Ro | Ro | |
| 1 good | no | no | Discontinued RD |
| 2 fine | no | no | |
| 1 fine | no faint | no VV | 83% 90% to shipping Dept presumptive RDs - |
| 2 fine | V | V | |
| 1 good | V | no | |
| 2 good | no | no | |

This is fine -
Note difference between 78 & 79 in
pressure & time in making clouds

Check the screening this lot had
extra fine particles

79 - BANNER S S

719 - fine particles - 3 min Contag
7 min 1200 lbs - Machine loaded
15 scrapes -
Transferred 35 Scheldale

| | | | |
|-------|----------------|------------|---------------|
| 1 OK | Dark | Red Center | |
| 2 OK | " | " | |
| 3 OK | " | " | |
| 4 OK | " | " | |
| 5 OK | " | " | |
| 6 OK | " | " | 100% |
| 7 OK | Very | " | |
| 8 OK | Very | " | |
| 9 OK | light | Dark | almost cooked |
| 10 OK | " | " | |
| 11 OK | " | " | |
| 12 OK | Dark red light | " | |

| | |
|---------------------------|-------|
| Print inspection | 7 OK |
| 8 OK | 8 OK |
| 2 OK | 9 OK |
| 3 no. Not quite full edge | 10 OK |
| 4 OK | 11 OK |
| 5 OK | 12 OK |
| 6 OK | |

Note to get it as good as this
Vapor must be even flow
+ Machine blades good

Prints -
91.6%

Print Inspection

1 OK Red on graphite, black on edge of label
 2 OK " " "
 3 OK " " "
 4 OK " " "

| | | | | |
|---|------|-----|-----|--------------|
| 1 | good | no | V | |
| 2 | good | V | VV | |
| 1 | fair | RO | RO | |
| 2 | good | RO | RO | |
| | | V | red | |
| 1 | good | VV | no | |
| 2 | good | V | V | 67 |
| 1 | good | VVV | VV | new with new |
| 2 | good | | | |

Surfaces not so good as all
 black & welded


80

4 Blanks 719 fine powder
 3 Contact 5 imp 1000 -
 Use 2 eq plates Grated both
 sides except edges & holes
 15 Min 500Gs - Cool

Print 2 heat 2 Contact 5 1000Gs

Transfers inspect.

1-2 OK

 Red about

1-2 OK clinked on edge, label misaligned

1-2 OK " " " " " " " " " " " "

1-2 OK nearly what we want,

This shows if proper blank & proper
 rigging for grafting this process.
 Can be carried out conveniently easily

409 Domestic wax has Rim out.
like 416 - not many small shapes
RO is rather loud -

411 Domestic wax same RO as
in 409 - more shapes - ||||| big marks -

412 Domestic wax RO vvv faint
full big defects on steel + surface
at mouth -

411 Dup print Big RO - amper lots -

409 Dup print ||||| - surface plain
soft, no RO -

81

6 Smooth moulds - 3 Foreign
wax 3 Domestic wax
Printed on Double transfers
from Matthews -

416 - foreign showed on all machines,
a good inch revolution ^{possibly RO} but hear surface
but lots small sharp scratches faint -

415 foreign - has a RO like a dull ground
coin just hear surface - full shaped

413 foreign, surface can hear louder than 415
has same RO, good a lot of
surges to some extent - has places where
there are ||||| (spilled)

413 Double print - Very good RO, probably
Blanch - surface much louder

Can't tell anything
about a smooth blank -

82

6 Domestic + foreign wax
like 81 but printed on
Reg. Schickels - 719 much
+ 55 Schickels - 185 copper

Domestic 411 - same RO as 81
Velvet surfaces - have stamps

No 2 print 411 - same RO as in 81
Surface little bluish -

Domestic 409 RO as in 81 - surface faint
" 409 Sup RO " " "

Domestic 412 Very bad RO -
" 412 2nd print weak RO. stamps.

Foreign 413 - weak RO - surface weak stamped
413 2nd print B.D. RO " "
413 3rd print B.D. RO surface of dirt

Foreign 415 RO like in 81 surface faint
415 2nd weak RO surface only faint

Foreign 416 RO sounds like cutting " " "
416 2nd RO " not so far " "

Dip - but blank made on 3-7 only
1000 lbs instead of 1200 -
B. 4 p.m.

- 1 = Discard Run red for occasional use also
- 2 Not filled to measure
- 3 Doubled up filled to rim in measure
although off by 62 ok -
- 4 Not filled edge

5 OK

6 OK

7 OK

8 OK

9 - NG Red rim -

10 OK. red edge

11 NG Red rim -

83

719 fine powder use 26 scraper
Blank 3 min Contact 7 min 1200 lbs
Cool

Transfer

Use very plates 15 min at 500 lbs Cool

Print

2 Heat 3 Contact 5 at 1000 lbs -

Print inspection -

1 Doubled - red edge many loose Rd Run

2 " slightly red on rim, many Ra

3 " no fill to edge of mass

4 Discard - Red blotches near rim and

5 OK

6 Doubled not quite full to edge of mass

7 ~~not~~ not filled to edge of mass

8 NG Bad fill, Red 6" long 1 1/2 wide

9 not filled to edge of mass

10 "

Test for flatness of Records of
72 -

- 1 = almost flat OK
- 2 OK perfect
- 3 20/1000 high in center better G mould
- 4 " " " No 2 & 14 moved
- 5 OK perfect
- 6 OK perfect
- 7 Dished 25/1000 - dish side down is OK
- 8 OK perfect
- 9 OK perfect
- 10 - nearly flat, extreme edge turned up $\frac{1}{2}$
- 11 - Rec. Cracked center - out -

Remarks - Nov 22 1913

Up to date, the following
proves best + is very fine

Shovel resin 4 loads to 1 Resin -
Resin 5/16 - Double ground
to give 50% passing thru 200
mesh

Machine jar loading -

Dressed 3 min Contact
7 min 1200 lbs -

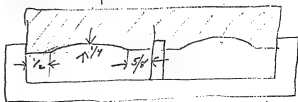
Scrapers flat with 2 concave
Called 26 scrapers

Top plates put in by machine &
blanks extracted by hydraulic
Extractor - Blanks Gated
 $\frac{1}{2}$ hour at 180 Fahr

Transfer Req plates 45CC 632
Varnish 15 min 500 lbs Cool -

Printed 2 heat 3 Contact, 5 min 1000 lbs
Cool -

84
New Scraper No 28



3 heat 5 1000 lbs —

Transfers —

- 1 OK
- 2 OK
- 3 OK
- 4 OK
- 5 OK
- 6 OK
- 7 OK
- 8 OK
- 9 OK
- 10 OK
- 11 - Roubleful
- 12 OK

no red

"

not filled. 4 darkened

not red

2 spots darkened

not filled dark.

not filled dark.

not filled dark.

Red little circles -

Red little circles -

See 86 - $\frac{1}{4}$ " too narrow

85-

Duplicate lot - 3 Cont 7 rat 1000 Lbs. -

1 NG ^{not filled} 2 lgs 3" long ^{1 1/2} wife
 2 NG " "
 3 NG " "
 4 NG " "
 5 NG " "
 6 NG " "
 7 NG " "
 8 NG " "
 9 OK
 10 OK

26 Scaper
 felt too far
 two Caracaras
 $\frac{1}{4}$ high in
 arch

28 Scaper

86

Prints Inspection

1 NG not filled in missio

2 NG

3 OK

4 NG

5 NG

6 OK

7 Counsel

8 OK

9 OK

10 NG

11 OK

12 NG Some faint, edge not filled.

5 OK

1 Counsel

(6 Discard)

2nd Lot - Duplicate

1 OK

2 NG

3 OK

4 OK

5 OK

6 NG

7 OK

8 OK

9 Counsel

10 NG

11 OK

not filled; sides edge of missio

" " very bad

only filled $\frac{1}{4}$ beyond missio
 Two light or fill in missio

7 OK

1 Counsel

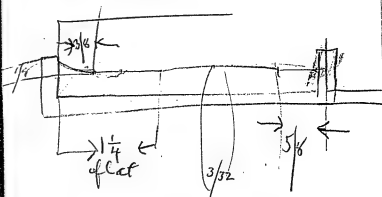
Too much in Central
 parts. Can't fill edges
 & print missio

3 Discard

$83\frac{1}{2}$ Dep 83.

3.7 m. 1000 g.
1200 lb.

No 30 Straper



12 Transfers Red varied-
position, principal transfer
Red blow up
cracked



#87

Dallys plates

45cc 632 lot 1574

2 1/2 baking. 240 Fels

Put plates in warm covered
truck after flaming &
sucked by blowers. The
alcohol vapors out

Did it in one hour

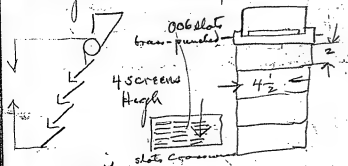
30 scraper 3.7 + 1200 lbs - 55 scheduled
3 hand release - P

1 OK black want fill
2 NG big red piece split off - tears -
3 OK black unfill
4 NG 2 birds + cooked it Edge
5 OK Red spots
6 OK "

The fact that hard releases on this
+ tears + not welding good is
due to too short baking -

No Print -

Daily slot screen reports



passes per screen 100 grams per minute.

of 700 lbs in 20 hours over a screen
One foot wide = 4 passes - or weight
16 screens a one pass

Tested 50 grms 19 powder

1st pass 20.5 grms weight there 12.2 grms of weight

passed 200 mesh screen

2nd pass 8.2 grms weight there 4.5 Then 200

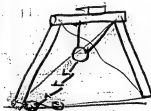
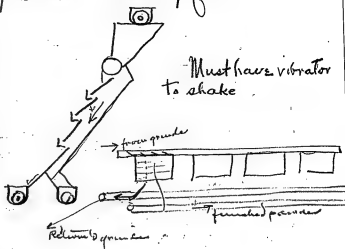
3rd pass 3.3 " 1.6 "

4th pass 2.3 " 1.1 "

It is probable that only the stuff
that went there on 1st pass is
what we want,

This gives 60 grms per pass per
foot of width, per minute

60% must be reground =
480 lbs in 20 hours one foot wide
for 12000 blanks requires 800
lbs of powder - Refine
4 screens Each 4 feet wide.



Dallys final Expts Screening
Powder -

Used the 4 way $2 \times 4 \frac{1}{2}$ 120 mesh
wire screens set at angle of
75° deg

50 grams ~~was~~ of the 9.9 fine
powder now being
used Run them in
47 seconds -

17.9 grams went thru.
of which 2.3 remained on 200 mesh
2nd trial

17 grams thru
of which 1.5 on 200 mesh
Under 11.5 is very fine
single fibers -

High viscosity seems to be
Bad - or short runs
Can't say which

88

Dallys 61 - 3 hours run
Temp 240° 632 V animals
Viscosity 1.2 min 52 seconds
Viscosity taken after slanting
45 hours

18 Scrapes Machine
Loading

55 Schedule
Transfer 4 sticks 2 frogs

1 = two fine pull out birds 1/2 Coral
2 Red not pulled 3 big birds 1
side. Cracked, Cracked, NQ

3 = line red birds on Mangrove.
1 bird Center Mirror 1/2 white 1/2 long

4 NQ - 1/3 Red lifted & Cracked
11



No wale

5 - Birds Red lifted up



6 Cracked



NQ

Prints inspection

- 1 OK
2 OK
3 Long run red spot not filled / No 11 Trenches for
4 OK
5 Counsel. Run not filled $\frac{1}{2}$ to remain
6 OK Counsel
7 OK - 8 OK - 9 OK, 10 OK
2 Trenches discarded.

75% -

| | |
|--------------|-------------------------|
| 1 faint good | faint |
| 2 good | VVV |
| 1 good | VVV |
| 2 faint good | RO |
| 1 good | VV |
| 2 good | V |
| 1 good | no RO |
| 2 good | faint |
| 1 good | VVVV |
| 2 V good | VVVV |
| 1 good | VV |
| 2 good | VV |
| 1 good | not filled RO then VVV. |
| 2 good | faint |
| 1 good | faint |
| 2 V good | no |
| 1 good | no |
| 2 V good | VVV |
| 1 faint | no |
| 2 good | VV |

that after you get the prints out of the machine you should see the prints are all good and the machine is working properly.

89

30 Scraper -
3-7-1200 lbs 719 fin
55 Schedule 632 1574

83.3%

- 1 OK -
2 OK
3 Double full - Cook Center
4 OK slight red.
5 OK " not filled
6 OK Dark red
7 OK slight red near edge
8 NG - Blister near rim cracked
9 OK Counsel Red near rim
10 OK dark red near center
- 11 G/L long red blister at rim $\frac{1}{2}$ " long
12 OK slight red

Print.

It is strange more than
 $\frac{1}{2}$ of Records Cut -

It was rather cold when
tested - 60 Fahr all night

Experiment on transfer

| | | | |
|--------------|--------------|--------|--------|
| 28 Scraper | 100 run thru | 91 OK | 91% |
| 21 Scraper | 213 " | 186 OK | 87.6 |
| 28 Scraper | 156 " | 135 OK | 86.5 |
| 21 Scraper | 472 | 436 OK | 90.2 |
| 21 Scraper | 283 | 260 OK | 91.9 |
| 1018 Scraper | 100 | 80 " | 83.25% |
| 2 " | " | 100 | |
| 3 " | " | 100 | |
| 4 " | " | 100 | |

31 Scraper



31 Scraper #90

719 - 555 schedule

Transfer 12 OK but 1 cooked 4 dark used in center

Private inspection -

OK in 1st

Red Center, not filled, good

Not filled out, run after minor

Several dark Red

83.3%

Blank recessed at Center
10/1000 on each side -

719-1850 paper
5" I

| | | |
|-------|----------|------------------------------------|
| 1 OK | Center - | OK otherwise |
| 2 OK | " | " |
| 3 OK | " | " |
| 4 OK | " | not filled from inside out |
| 5 OK | " | OK otherwise |
| 6 OK | " | Red spot on run, not filled in run |
| 7 OK | " | Not quite filled margins |
| 8 OK | " | OK otherwise |
| 9 OK | " | " |
| 10 OK | " | " |
| Sup | | |
| 1 OK | " | " |
| 2 OK | " | " |
| 3 OK | " | not filled on 2 dgs |
| 4 OK | " | OK otherwise |
| 5 OK | " | " |
| 6 OK | " | not quite full on margins |
| 7 OK | " | " |
| 8 OK | " | OK otherwise |
| 9 OK | " | " |
| 10 OK | " | " |
| 11 OK | " | " |

Would we have been using for tests lately
(Tracked)

- ✓ 434 old dope - very shallow grooves in shaving steel.
- ✓ 67 old dope M. Sub M. Miller, WM - old dope
- ✓ 18 old dope Sub M from WM main
- ✓ 42 old dope M " " New Dope
- ✓ 52 old dope M- " " old dope
- ✓ 14 old dope " " old dope
- ✓ 13 old dope M- " " old dope
- ✓ 17 old dope M " " old dope
- ✓ 9 old dope M " " old dope
- ✓ 50 old dope M " " New Dope
- ✓ 4 old dope M " " old dope
- 3 old dope M " " old dope

Test for Run out only



Full height of line is a disc

Test of Dimondies grafted tracked
White Master by hand feed in big
Cam Machine 1 twice over silk wheel
Velvet pad, 4 minutes

1122-150- G3

Celluloid print, just on limit of Edison
hearing for general surface, a good
many small snags which probably
Comp. from celluloid

Surface on Celluloid OK - Horn
right inside Cabinet Best 2 ever
heard bearing snags - which there were
62 over 100 weak ones

1122-151- No G2 - On celluloid

at 1st Cant hear general surface horn right in
funnel 1/3 across hear it very faintly right
on my limit - Very few snags in
this compared to G3 = but there are
3 big snags or 5 other weak snags

G-3 in condensite. 719-

Has a blank RO, general surface velvet
and is good, to me its 4 times louder
than Celluloid - To Dimondier & Mason
its very little louder because
they cannot gauge Volume -
less snaps than in Celluloid -
2nd ^{G3} print weak Run out. Vx surface
about same as 1st Velvet in irregular
previous test would be marked
V Good.

3rd Print G3 Condensite Bad blank
RO - surface about same -
bad snaps near start,
RO allway across -

G2 Condensite -

VVV RO changing at diff points -
Surface perhaps not so good as G-3
but duller, Surface would be rated
Velvet & Good - Same snaps as in Celluloid

2nd Print - V runs out 1/2 way
then VVV - surface about same
as 1st print, Same snaps as in Celluloid

3rd Print, Snaps same -
1st 1/3 - VVV RO - surface Good
Velvet.

This looks as if the
grafted White Master
is sticking with
Copper ink bath -
is OK -

Dec 5 1913

New blanks run (then County
694 tested 206 Discarded)

| | |
|---------------|----------|
| 79 for knobs | 488 OK - |
| 57 Cracked | 71% |
| 34 Run Out | |
| 25 Cracked | |
| 3 Poor print | |
| 3 Scratched | |
| 2 over spots | |
| 1 Bad Label | |
| 1 Center Hole | |

Test for RO = No 1. OK for RO, but limit

2. Cannot hear RO -
- 3 - little too much RO on start
4. No RO
5. More RO, but not bad enough to reject
6. Limit for run out starts
7. No RO
8. Limit for RO
9. Little too much RO
10. Limit of RO
11. Bad RO
12. "

new rack

2586-A Sorensen Moskowsky
Fur Seal Quilted -

On Celluloid - new
Copper Dope Velvets

only 2 or 3 small snags -
surface is not dead velvet.

2565-A - Monte Cresto

Plated in old Dope

Shade more velvet
than Moskowsky - Val

Much difference -

2584 C Vocetrial

Simms
Monte Cresto
old Dope
Wool Graham

old looks appear more velvet +
more snags.

12- 110k 91.6
 12 10 83.3
 12 9 75.
 12 8 66.6

$$\begin{array}{r}
 12 \overline{) 110} \quad (91.6 \\
 \underline{108} \\
 20 \\
 \underline{12} \\
 80
 \end{array}$$

$$\begin{array}{r}
 12 \overline{) 90} \quad (75- \\
 \underline{84} \\
 60
 \end{array}$$

$$\begin{array}{r}
 12 \overline{) 100} \quad (83 \\
 \underline{96} \\
 40 \\
 \underline{36} \\
 40
 \end{array}$$

$$\begin{array}{r}
 12 \overline{) 80} \quad (66 \\
 \underline{72} \\
 80 \\
 \underline{72} \\
 80
 \end{array}$$

$$\begin{array}{r}
 1500 \quad (50 \\
 \underline{1200} \\
 300 \\
 \underline{300} \\
 0
 \end{array}$$

300 Minelike

3.

3. 2.5.

32

50 / 1000-



[ITEMS(S) FOUND IN BOOK]

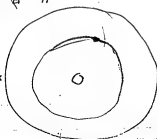
Nov 6 1913

Rivet

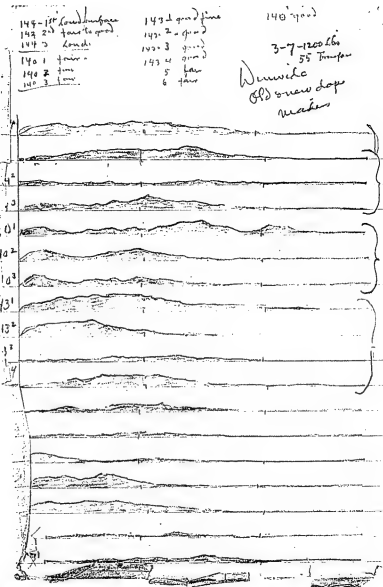


50000 between 2 plates
drilled with $\frac{3}{8}$ rod and hat
1/16 bridge left
supported by a cord &
by center rod

Plates $\frac{1}{16}$ thick



[ITEMS(S) FOUND IN BOOK]



**Notebook Series -- Notebooks by Edison
Notebook, N-13-12-08.2**

This notebook was used during the period December 1913-May 1914. The entries, which are by Edison and Sherwood T. (Sam) Moore, pertain primarily to the molding, transfer, and printing processes involved in disc record manufacture and to the construction of record blanks. The entries at the beginning of the book describe experimental transfers and indicate the effect of polishing the molds used to print the records. Additional entries relate to the surface qualities and treatment of the master records onto which recordings were made, forming the base for subsequent molds. Another group of notes describes experiments with bumps or "lumps" on record blanks to determine if and how the surface might become smooth when heated. The entries in the remainder of the book describe a sequence of experiments, numbered from 12 through 369, which involved pressing powder in blank molds with a pure rubber plunger "to get even pressure all over" during the formation of record blanks. The goals were to smooth off the surplus stock (using various scrapers) after the rubber pressure without disturbing the pressed powder and to prevent the powder from sticking to the rubber. The entries for experiments 12 through 44 are by Edison. Among the results noted are the thickness of the blanks, transfers, and prints, as well as the quality of the transfers and prints. The results of the remaining experiments, recorded by Moore, appear in tabular form. The notes indicate that H. Grimes also assisted Edison. Inserted into the book is a note to employee F. C. Pullin regarding an old dynamo belonging to Edison. In addition, there are seven pages of typewritten comments, which were prepared by former employee William A. Hayes during the late 1940s or early 1950s for Vice Admiral Harold G. Bowen, executive director of the Thomas A. Edison Foundation, and Norman R. Speiden and Harold S. Anderson, curators of the Edison laboratory. The front cover is labeled "8 December 1913," "Mr Moore," and "Experiment on Blank." The book contains 135 numbered pages.

N-13-12-08,2 E5735

Note:

R.O. = minor out. minor music
personnel or person out, due
to light printing

Sept. 2, 1979
1/22/1979

Home Co.

MFG. CO. 11/11/78

96 11/11/78

19 11/11/78

54472

Evidently not contained
+ surface separated

Mac Dryer 160 Fals till powder dry
3 to 3 1/4 hours -
719 B Not baked - pressed 1000
lbs at 10 lbs O.C. em -

Transferred 900 Lbs pressure
80 Lbs oleum

2 min Contact

1 Low -

5 High 900 Lbs

Van 632 lot 1554 -

3 pieces one black -

2 OK

2 had small piece out
but were present & R

Print Reg. Labels

1 hour

1 hour
RO

2 "

1 fair

RO

2 hours -

RO

1 fair

RO.

2 (parts good)

1 hour

1 (parts good)

1 hour

2 hours

RO

719 - 1000 lbs wt 350 -
Retaining top disc in Drill at
Lab -

Transfer Reg 800 lbs

Printed 1st time Movie OK
Edges thin did not fill -

Printed 2nd time on flat
Master Moulded -

1 good
2 "

vvv faint
no RO

2nd 1 had chiller marks from retaining
disc

Extra good 1 good
2 good

No RO
No RO

Drop of 18 - 719 - heavy loaded at
Edge (Dipping & scraper -

6 blanks transposed 2 min Conical
1 min low & High 1000 lbs

4 OK 1 didn't feel cracked 3/16 from
Edge other side OK -

not filled  cracks -

one blank OK one side other has small
pull out & cracks -

Prints = 5 OK - 1 wide edges of red
cracks -

15 good -

vvv faint

67 good - dirty blank

v faint

15 faint to good

faint

67 fine

vvv faint

15 faint to good -

v faint

67 good

vvv faint

15 good -

v faint

67 good -

vvv faint

15 faint -

no RO

67 fine

no RO

15 good -

vvv faint

fine

Dup of preceding page
with exception of 1000 lbs on
long schedule 7 3 4 7 - 1000

Transfer 6 all OK one has pull
out around hole both sides

Prints all have very wide sized edges
unlike short schedule -
Cracked edge wide red III

OK III. Long schedule seems bad for
printing

| | |
|---------------|-----------------------------------|
| 15 - faint | faint |
| 67 fine - | VV faint |
| 15 good | V faint |
| 67 good | RO - Edge faint like stone end |
| 15 good | V faint |
| 67 good | faint |
| 15 faint good | V faint |
| 67 good | VV faint |
| 15 good - | No RO |
| 67 good | faint |
| 15 good | No RO |
| 67 " | V faint |

Dec 8 1913 — (5)

719- Reprints

24, picked out to suppress them
several times —

1 Reprint - 21 OK 3 poor prints labels OK

2nd same 24 - 22 OK 2 poor prints "

3rd same 24 17 OK 5 " 1 poor label 1 OK

4th " 20 OK 3 poor prints 1 OK, 2 poor

Notes - discussed Cracked one,

12 tested is 9 surface good although
considerable number small bumps
at start 1 Bad Run out,
one a slight RO as its the Cracked one
8 had no RO. 1 VVVV -

This shows can suppress OK
at a high percentage.
Will continue to print these

2074 - Males No Romeo + Juliet
Vocal - Blasts bad. Males
Reported it Oct 15 - yet
Hayes never said anything -
Hoes quines palish -

All Eternity 1265 -

Thes also blasts bad -

quines palish thes
also

444 719 blanks — 1

Records printed —

Qril Rectified

90% blanks
pured

47 Knocks

15 Cracks

30 R. Culi

30 Cracked

60% —

42 Bad print

2 scratches

1 Rough surface

12 Podi Label —

74% of
Minit labels
taken out

Rout test by Edison

1 = } OK. pass it faint — then could pass
2 = } VVVV.

1 } w flower — to much RO on start
2 } OK —

1 } Little too much RO - Mary
2 } Lower Pine - too much RO -

1 } Lower Pine - too much RO
2 } OK Mary -

1 } Battle Mountain Bad RO
2 } -OK - ~~pass~~

1 } Loveland Wells Bad RO
2 } OK -

1 } Calumet Too Much RO to pass
2 } _____

1 } Calumet, Cant hear much
RO,
2 } This should have
been passed its
very good for small RO

9

- 1 } -Cavaliers limit, this could pass
 2 } -OK. Nothing worse

- 1 } My Heart, OK
 2 } Run Out - descended too much

- 1 } Wagpie OK.
 2 } Too Much Run Out

- 1 } Wagpie OK Not too much RO
 2 } Too much RO,

- 1 } Wagpie - little too much RO
 2 } Too much RO

- 1 } Wagpie, little too much RO
 2 } Very Bad RO

- 1 } Apple Normandy #18 moved Bad RO
 2 } OK -

- 1 } Normandy #10 moved - Bad RO -
 2 } OK -

- 1 } Normandy #10 moved Bad RO
 2 } - little too much -

- 1 } AB Normandy #8 M RO on limit - pass
 2 } - Beyond limit for RO

- 1 } AB Normandy #2 moved within limit
 2 } OK for RO -

- 1 } Normandy #2 moved OK within limit
 2 } RO moved - No 8 moved

- 1 } Jay of my heart OK
 2 } Sleepy Rose - just within limit

- 1 } Jay my heart: OK
 2 } Sleepy Rose - OK } OK

10

1 } Misconis OK
2 } Too much RD -

1 } Misconis OK
2 } Too much RD

1 } In Cases - RD too much
2 } OK -

1 } ~~in Cases~~ Cavatime Too much
2 } OK

1 } in the Bind - Too much RD
2 } Limit all over -

1 } Working Bind OK - } OK
2 } ~~at~~ OK not too much

1 }
2 }

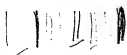
Dec 7 1913

By polishing Measurments
working moved 3 times
6 times over each time -

+ testing Record before packing
+ after 3 times all over
719 blocks - The surface
is decidedly unmistakably
improved. instead of a
sharp loud general bang
the packing is softened it
made it velvet, the fine
crackles are only softened -
Its present state is that
Palawan Measurments
+ then lots moved would
make it very good -
Used Cavatime for the brush
Rangs + I think Kevan



Has a knock nearly every revolution at
place



Grafted Master Tracked Blank
G4 - 3 turns of big Cam
1st one done automatically —
1 Rev in 45 seconds

VVRD - Rather Low General surface
signs of surface was made up of
Very fine cracks. Has a ring in
addition to general scratch -

Not good
enough

G4 2nd Print

V RD - Surface better than 1st print
Bad buckle about - Rings bad,
Surface pretty fair,

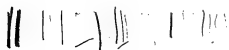
Probable trouble is 1st
Coat too thin, should be
2 or 3 times thicker when
we transfer to Reg Bath
Zeller surface gets bad don't need good
diff. quality of Copper

G-5 = ^{graded} 10 turns of Cam -

VVV. Rump - vent - VV -
 now only hear RD V - Rump
 Can't hear gent. ^{longer} Rump anymore

Not good
 Enough

Bad Start



2nd Round



Thrup

3rd



G. 6- Cam record and
6 times, Boxes blown out
719 Blanks - apparently
looked clean when
put in graphite box -
Didn't look at it
in Micro -

Load - no RO - Rumble RO
Comes in 1/4" in - 1" in heavy
velvet / RO - 1 1/2 vvv
velvet near end fair to good on line

2nd Print

Very Load - vvv - 1/8 in surface fair
RO contaminated but action not sharp
1/2" - vvv - last 1/2" of RO -
fair to good surface

3rd Print Load VV 1/8" in surface V

End of
not good
surface
may not be
aligned
enough

G-6 = 3rd Print, Rewashed by Moore

Belters start, good in $1/8$ V

Must be dirt on blank before
printing -

No 2 again washed belt

good surface RO, - disappears
 $1/2$ way across -

This washing in making
a test of a mould is
very important, The
banding of test blanks
etc all way there is
very important to
probe out mould,

#2 Belter wash

12 11

64

1st



No Dirt

2nd Print



Dirt

3rd print



Dirt

65

1st Print

G 7- 20 Times of the
Cam in grazing -

family velvet No RO at about
1/4" in VVV state, after
get in 1/2 good surface
4 VVVV - 1st start general scum
is louder than should be but
after get in 1/2 inch surface is
good, but not V good -

2nd Print

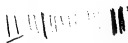
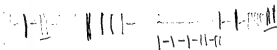
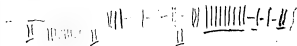
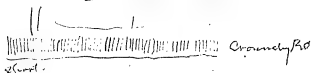
Surface Velvet good - No RO - 1/4" in
RO looking on 10 sec 8 (thump, has
thump of 15 to 4 - groups - 6
thuds all through -
General surface good
but not V good -

3rd Print surface fair to good VVVV
Not as good as 1st & 2nd

G6 No1 print on Celluloid

Start Rough - $\frac{1}{4}$ " in only fair surface
about as hard as Conductor -

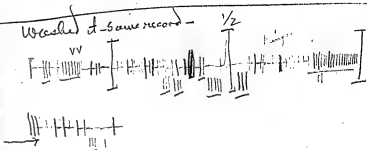
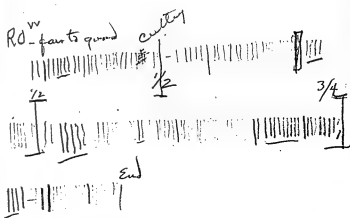
2nd print on Celluloid -
better than 1st. RO in this -
better surface -
general surface better than 1 but
fair to good.



68

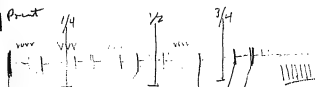
G-7 = 5th print - Printed series
with clean blanks + Care used
all way thru

69

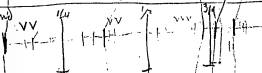


No 6 - 5th print.

1st



2nd



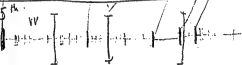
3rd



4th



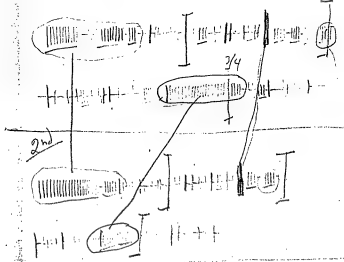
5th



G7=



G7 = Leached + Printed with Care



Microscopic -

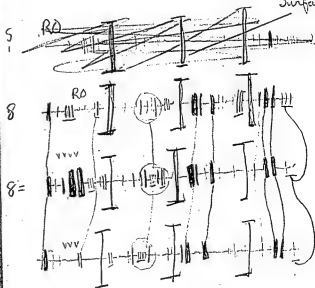
Doubtful

S

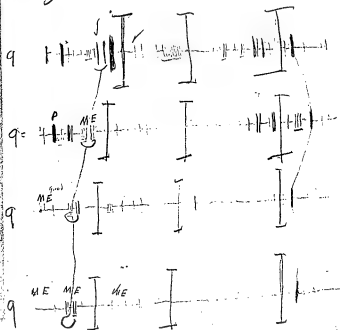
G 8 = Pad changed twice -

Washed - Cane taken all way thru -

Surface fair



G-9 pad charged 4 times — ①



Experiments with Tite on
Blank + heating only to
see if Tite sinks, =

Fig blanks 12 - 2 min heat
in press - Top next in contact
with next plate, $\frac{1}{16}$ away

1 = Now sign of the fit mark on either
Top or bottom - show small phase
on bottom where label represented

2 = No sign on top - shows base of Contact
around center hole bottom plate

3 = Nothing on top - trace of fumes
on bottom about the center of
fumes - No sign Tite

No 11 - Nothing on top - Bottom -
Traces of Label & one tit

12 = Nothing on top - shows pieces
of Label & one tit -

This shows bottom moulds
are nearly hot enough, but
~~the~~ Top moulds are not
hot enough to preserve
mould from injury

Also the further you go
down the hotter the hollow
mould gets ~~signifies~~ ^{signifies} shows
there were taken out -

4 = Bottom - traces of Label -
Traces of a Tit on bottom
nothing on top -

5 = Nothing on Top - Bottom - small
part of Edge of Label shows -

6 = Top nothing shown - Bottom
Label & music shows in spots

7 Nothing on top = Bottom
traces music -

8 Nothing on top = Bottom
Edge Label: (2 in.) round there is
music all round

9 = Nothing on top = Bottom shows
considerable music

10 = Nothing on top - Bottom
shade of Label

[Signature]

6 = Top - nearly filled - looked blank
looks like soft blank -
thrown out

7 = Top part label missing around
Edge, Tils good ^{the} Bottom
Some label, only faint green
music - Tils good

8 = Top part label + music all
around edge - Tils almost
sharply - But music + label
at diff places - Tils good -

9 = Top inner label + little music
at edge Tils not good
Bottom same -

10 = Top - center blank, look pressure
little music on edge Tils faint
Bottom like top -

11 = Top - music diff parts, label a
little faint Tils -
Bottom same as top but Tils
strong -

12 = Top - only label Tils pretty good
Bottom like top -

12 - 3 minutes in contact no
preliminary heating -

1 = Top - nearly whole label present
4 Tils shown - Bottom -
label 2 1/2 dm + 4 Tils shown -

2 = Top outer edge label shows 4 Tils
shown part of music all way
round outer edge for 1/2 inch
shown - Bottom about same
as top - Tils show up good -

3 = Top - no label shows - outer
edge music shows - Tils show
good - Bottom light uneven
inner label - Tils show up
good -

4 = Top label shows nearly all
outer edge shows music
Tils good - Bottom same

5 = Top - brushing in center - skip down
of music - Tils not shown good

No daily to the top

10 = Top - Slight crease music edge - none
 of edge label Tite faint - Tite faint
 Bottom - Tite good - little music on margin

11 = Top Label on margin - music faint
 on edge Tite good
 Bottom delts -

12 = Top - Slight crease label & music - Tite good
 Bottom same - Tite good

Find out how these taken out
 press

2 Heat - 3 Contact - Contact
 means top plate you can just
 see light thru it -

1 = Top - binding took pressure - Some music
 all over Tite good - Bottom like top
 Tite good

2 = Top - bind up out label music on edge
 Tite good - Bot like top, Tite good, not so
 much music shown -

3 = Top label nearly full - some music
 music Tite good - Bottom same

4 = Top music label - music all around edge
 Tite good - Bottom same as top -

5 = Label shown - music at place
 Tite fair - Bottom delts -

6 = Music around rim - faint label
 label - Tite good - Bottom delts -

7 = Some label - music slightly on edge
 Tite good - Bottom delts -

8 = Bush takes pressure little music on edge
 Tite good - Bottom delts

9 = Soft Blank

Wants higher tits

So that on 2 min heat
it shows no print of any
kind -

The tits as they are now
would be OK were it not
that 6-punks are irregular

1 min Heat 6 Contact,

1 = Top - Some label + music on edge Tits OK.
Bottom - ditto -

2 = Top label - Tits good - Bottom same

3 = Top + Bottom show considerable
music - Tits both sides good

4 = Both sides show considerable
music - Tits good -

5 = Same as 4.

6 = only little music - tits good - both
sides same

7 = Tits good - some music both sides.
8 - ditto -

9 = ditto -

10 = some music both sides - tits good

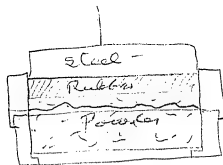
11 = ditto

12 = ditto -

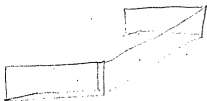
9 10 11 + 12 don't get as hot as
1 2 3 4 - How were they taken out,

April 24 1914

Expts with pressing
powder in blank moulds
by gives rubber plunger
to get even pressure all
over



line showing uneven plug
line after removing surplus
Then Steel disc is put in &
pressed Reg - gives even
homogeneous blank
gives high % transfer
Prints -



Tried this to scrape off
surplus - No good
Tore great chunks out
of surface. Wire best
so far to cut but not
smooth & then remove surplus
by an edge

The lifting up of rubber
didn't lift surplus up like
with the 2 pieces of Rubber



Lifted it this way

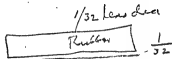
2

23

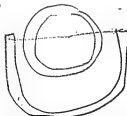
Experiment tonight is to find
good way to remove off the
surplus stock of Ray
Rubber and pressure without
disturbing the powder in
mould that has pieces
I'd to prevent sticking
of powder to rubber
I'd to get it round &
cheap

NO 12 =

300 lbs -
on 12" Ram

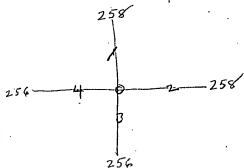


Tried Wire to cut off surplus
best Thus
450 lbs to inch
corn powder



#12

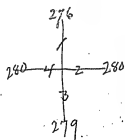
Calliper



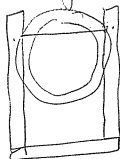
Transfer



very shallow & slightly bent so as to approximate



but it wasn't made right,
must have a guide (thin wire -

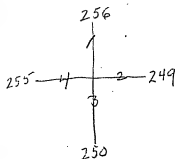


then wire won't spring -

The soft $\frac{1}{32}$ Reel + $\frac{1}{2}$ " Reel
lifted straight up -
didn't disturb surface
scarcely any -

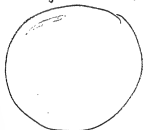
little wire into three samples
without dragging & will
be a success - 102
scrapped samples all
with straight edge
but 102 was having a
Reg dirt scraper top
made -

#13 Calliper

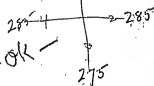


Transpa.

both sides -
but 256 -
slightly lower
than 250



Transpa.
Calliper



Evidently
must take
a touch
more off
ring -

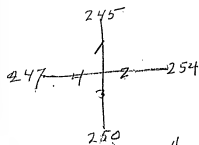
Print OK -

#13-

Rubber disc - no extra piece -
only slight air lifts - used
wire it dragged out only a
little in and thick spot it
show be guided & held in frame

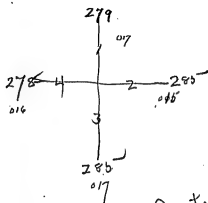
On 13 we used the scraper
with bevelled edges, it don't
run much in box but could
up in front & apparently
is not the thing

#14



005-

After transfer #14

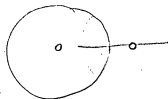


007

Print ok

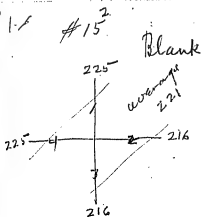
#14

Reg way 300 lbs on 12" Ram
 packed Reg scraper -
 Rubber pad -
 Scraped off by raking
 flat scraper



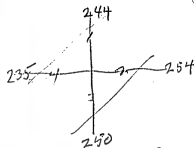
Turned around + advanced in 1st
 This form of scraping is
 perfect, don't disturb surface
 we want a doc it very
 nicely - + fingered up
 men uponed that makes
 mistakes

60



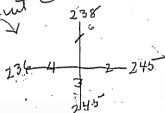
Very shallow
will print
OK

Transfer



019

Print OK



61

Apr 26 1914

#15 = 37 scrapes (new)

Use Ring turned down another
tenth of inch. Now 8/10
by using #50
opms there is no full 1/8
Excess — 100% given over
Excess by rotating front
scrapes work fine —

We had trouble get out Bubbles
had bit especially ~~too~~
steel plate stuck hard in
brass ring —

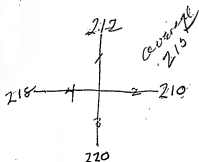
We didn't get scrapes down
as far on this bit hammer
was young — didn't know
recepting much as scrapes
not down as far as scrapes

Moore marked low side, angle mark
edge —

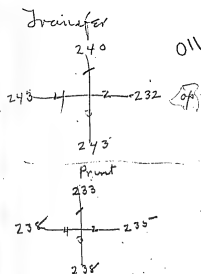
57

16 Blank

779 Varnish
5% 1/2 phard



Deffen
-010



Print OK

58

16

450 grs - 37 scraper

Not Rapped -

Surplus Milled off
by straight scraper

as we don't rap this is likely
to be less Calliper than 15 =

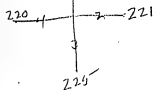
The Rubber pad stayed on
Moore slide it off a bit
left it surface fine - Edge more
Took off edge of surplus but
this don't matter as it must
be taken off anyway

Put under scraper &
instead of going to Center
then turn to mill off surplus
Passed whole mould
Clear across scraper

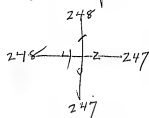
62
Hic It couldn't go far
enough so we went nearly
across & then turned
the mould —

We can fix this by
2 Extra leaves that can
be let down between
reg leaves after paper

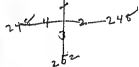
#17-

Average
223Del
O10

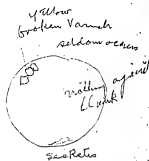
Transfer



Print 248



Print OK
bigger after
printing or
no change -



#17

479 Var

(56)

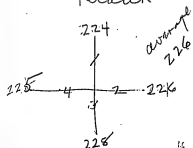
Straight Graper 450 -
Rapped -

In stripping out under
magnet, then pressures on
steel disc & rubbers -
then scissored for rings
ring then scissored steel
disc by magnet then
pulled out manually & reappd
Rubber ring from
coming with it lost
part sulphur powder scraped
off - but its OK -

Had to turn mandrel to
mill off as pin was
too long - also handle
getting so close low enough
to mill off - ~~to screw surface~~

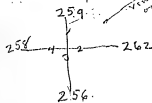
⑤

Blank

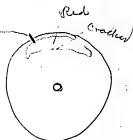


Diffusion
004

Irregular, 228 Vener. off
Vener. off
on both sides



006



228

#18

1st Bad Transfer
749 Vm

Dup of 17-

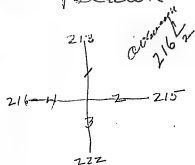
Strait Scaper - ng

Where the Red is looks like
not drawn looks as if
Vener. too thick here & gas
Cooked out but big pieces
& sheared it where free &
climbed - seems to show
that if Vener. too thick
one side it will cause this

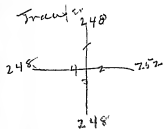
Note # of
Vener. off

(8)

Blank

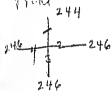
Def
009

Transfer

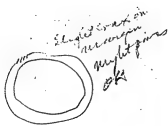
004
OK

4.54 kg left
non polished
beach sand
very
red
Transfer

Print



002



Eligible for an
insurance
policy
OK

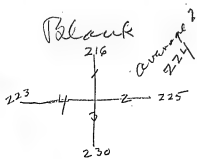
#19

479 Var

Dup 17

OK

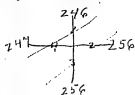
(67)



Dib -
014

black
not red
very
shallow

Transfer

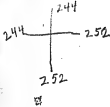


010

1. Bond

overide only
OK Transfer

Print,



Print OK

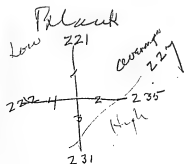
20

MM9 Van

Group of 17
OK

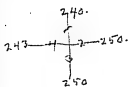
(68)

632 Var



014

Incorfer



OK

D10

dark shells



(69)

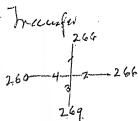
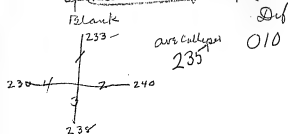
Rubber ^{fasten}
to steel
plate 22

All numbers up to &
understanding this, been
tapping at 40 per min
initially of 60 belt slipping

Secured Rubber to steel
by Becumax

This is 1st one made this
way to the $\frac{1}{8}$ small
at next the $\frac{1}{32}$ smaller
Dia Rubber -

(11) All blanks up to & including 23 made on NO 15 press & spools - lifts up first.



Transfer OK
no red

1600

23

632 Var

The Hammer belt been slipping up to this come -
Now 60

In raising up the Rubber it pulled up surface near Edge somewhat badly - all over there are waves raised that are 10 or 20 μm high - but it above the surface probably only occurs in the replaced about extend to good part,
filled some fine over surface.

24 & hereafter will be
made on the 4-press
old style connection

Blank

226

229 average

005

227 4 2 221

231

Transfer 256

245 4 2 263

248

016

Transfer
OK
no Red

#24

632 Var

Drop of 17 - Hammer
Run $2\frac{1}{2}$ min -
which is little bit longer
because probably scraper
was set a little lower

Surface after lifting Reelbar
was good on this, only
2 or 3 slight ripples

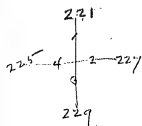
This one has the large full size
Rubber in - it sticks bad in
Brass ring - its took big
Caught Rubber & tore it.

Must use $\frac{1}{8}$ diameter instead
of this $\frac{1}{32}$ -

(7)

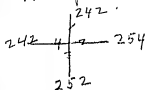
Blank

632 V



008

Transfer



010

OK v. +
slight red log
angle light in
spots -

Print OK

No cracks
" four points

25

632 Var

No 4 press

450

~~Hammer 60~~ you one
min stuff all spread -

Hammer (60) one min
mix all spread

Note from 15 to 23 -

#15 to 24

Dry in Cellar

afternoon
009 - 221
010 - 215
010 - 223
004 - 226
009 - 216
014 - 214
011 - 220
014 - 227
010 - 230
005 - 229

not repeated

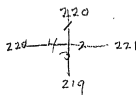
40 speed hammer

60 speed hammer

"

15 per
14 per

Blank



002

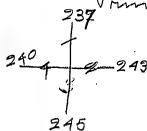
Blank

No 1



dark shade

Print



006

H 26

No 4 Pres

1/50-

Trail Scrapes

Hammers (6) of Oke
 mix - mix all over

Hammers 60 -
 about mix to mix -

66

Blank



007

007

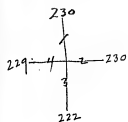
Prints OK

67

27- 4 pres
Steel Scraper 60 Knox

18

Blank



008

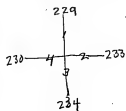
Point 075

28-

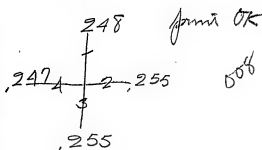
Straight Stamp - 450 grains. $\frac{1}{8}$ pad

80

Blank



005



81

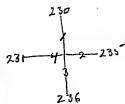
No 29 -

Straight Scaper

1450. ppm / stud

132

Blank

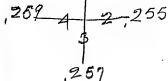


006

Prints OK

,254

005



no 30

Pad $\frac{1}{8}$ less dia
than ring

Straight Scrapes .450 grm $\frac{1}{8}$ pad

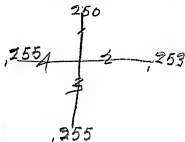
(84)

Blank



002

Prints OK



005

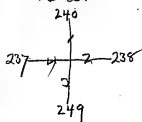
(85)

31-

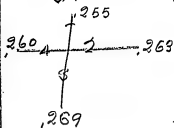
Blank Scraper 1650 $\frac{1}{2}$ pad
 3 $\frac{1}{4}$ mm for powder to leave
 stoned Edges blades act low

(51)

Blank



Prints OK



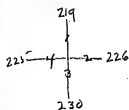
32

(52)

Strait Scaper 450 $\frac{1}{8}$ pin

On 2 minute for powder to leave
 Strait Edge in pkg

Blank

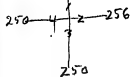


009 -

Transfer

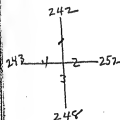
245

011



632 Van 208 lat.

Print OK full print



010

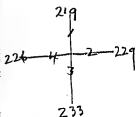
Crack Pull



Straight Scraper 450 gms 1/8 pad

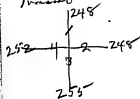
Pkg 1/2 min on Straal Scraper
to leave Scraper Hammer 62 min

Blank



014

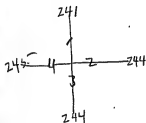
Transducer



632 Van Lat 208,

007

Print OK, no cracks - full print



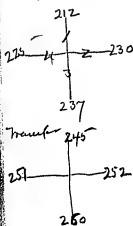
004

34

~~Strait~~ $\frac{1}{2}$ min to pack -

(97)

Blank



025

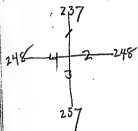
Transfer 245

632 Van 208 lat.



015

Print OK - full print no cracks



020

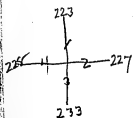
35

Straight Edge

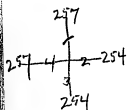
 $\frac{1}{2}$ min to pack

Blank

010



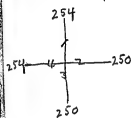
Traceform



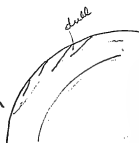
632 Van hat 208,

003

Print OK full print,



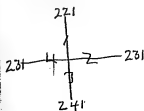
004



36

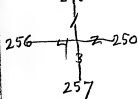
Strail Scaper
1/2 min load

Blank



020

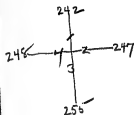
Transfer



632 Van Lat 208

012

Print - OK full print no cracks -



013

37

Strait Scaper
1/2 mm lead -

Blank

227 — 1 — 2 — 228
3

003

Transfer

230
253
253 — 1 — 2 — 245 —
8
246

632 Vars
Lat 208

007

Print OK ^{mostly} full but OK.

250
248 — 1 — 2 — 246
3
243

007

only a shadow
check

38

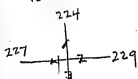
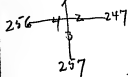
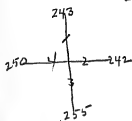
62 Knop

Strail Sinker
1/2 min to load

(10)

Blank

006

Transfer -
241632 Vari Lat 208
016Print OK - filled fine cracks on dull way
at Edge -

012

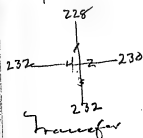
(10)

39

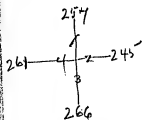
Strail Edge
1/2 min

(11)

Blank



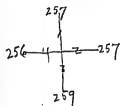
004-



032 Var lat 208

021

Print OK Cond-



003



Due probably to Uneven
Yarnish - see Calligraph

(12)

40

Strait Edge
1/2 min -

62 nox

(103)

Blank

225

005

228

230

Transfer

250

252

250

632 Van (at 205)

007

Print OK full print. no cracks -

249

250

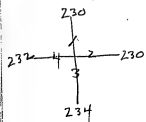
245

007

41

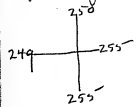
Strait scraper 62 nox
1/2 min

Blank



004

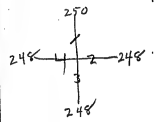
Transfer



632 Van Lot 208

006

Print OK filled no cracks -



002

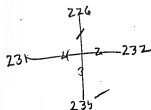
42

Renauli Scaper -
1/2 mm loading

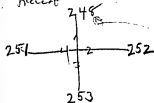
(107)

Blank

012



Transf -

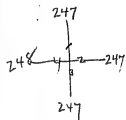


632 Veen hat 208

004

light file but
OK-

Print, OK-



001

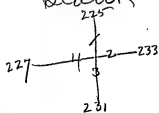
(108)

43

Strait Scraper

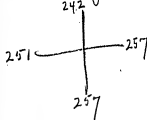
 $\frac{1}{2}$ mm

Blank



008

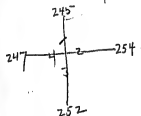
Transfer



632.V

015

Print Badprint



009



other is ok -
will reprint -

44

Strail scraper
1/2 min loading

Have this reprinted

from 32 to 44 -

12 Blanks 100%
12 Transfers - 100% good
12 Records 92%

but lost print ok but didnt
fill music, will reprint -

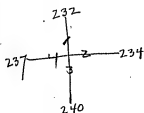
Up to here 44 Prints

3 lost, 94% Prints
100% Blanks
100% Transfers -

of the 3 lost 1 will reprint &
the other 2 were a special Varnish
lost due to the Varnish -

*

We Calliper 55



008,

* Moore says its in Pres

12 Prints
all OK

Straight Edge Loader

45 feet -

| | |
|------|----------------|
| 46 | 55 sec loading |
| 47 | 55 " |
| 48 | 52 " |
| 49 | 55 " |
| 50 | 55 " |
| 51 | 50 " |
| 52 | 60 " |
| 53 | 60 " |
| 54 | 60 " |
| * 55 | 60 " |
| * 56 | 60 " |
| * 57 | 45 " |

We now transfer & print these

* noticed one edge of metal disc in hydraulic lower than other edges
this only just noticed - might have been doing it right along

30 sec Loading
 30 " placing Rubber pad in
 60 " placing Mould in press
 30 " Removing Rubber
 60 " Scraping off
 30 " pulling Cover on
 240

With auto scraper save 50 sec
 Making it 190 seconds

60) 190 (3 min 10 sec -
 120

About 3 minutes, there is
 200 in 10 hours -

Think Can do 250 in 10 hours
 when everything rigged up
 right.

Starting at #17

No 1 Caliper 224 Transfer 259 - 35
 1 " 215 248 35

Calipers on No 1 Line

| | Blank | Transfer | print | Def |
|----|-------|----------|----------|-----|
| 18 | 224 | 259 | | 35 |
| 19 | 213 | 248 | 244 .001 | 35 |
| 20 | 216 | 246 | 244 .002 | 30 |
| 21 | 215 | 250 | | 35 |
| 22 | 221 | 240 | | 19 |
| 23 | 233 | 266 | | 33 |
| 24 | 226 | 256 | | 30 |
| 25 | 221 | 242 | | 21 |
| 26 | 220 | 237 | | 17 |
| 27 | 226 | | | |
| 28 | 230 | | | |
| 29 | 229 | 248 | | 19 |
| 30 | 230 | 254 | | 24 |
| 31 | 230 | 250 | | 20 |
| 32 | 240 | 255 | | 15 |
| 33 | 219 | 245 | | 26 |
| 34 | 219 | 248 | 241 .007 | 29 |
| 35 | 212 | 245 | 237 .008 | 33 |
| 36 | 223 | 257 | 254 .003 | 74 |








| | Blank |
|----|-------|
| 37 | 221 |
| 38 | 227 |
| 39 | 224 |
| 40 | 228 |
| 41 | 225 |
| 42 | 230 |
| 43 | 226 |
| 44 | 225 |

Wagon
man

| Transfer | Print | dip |
|----------|---------|-----|
| 245 | 242.03 | 24 |
| 253 | 250.003 | 26 |
| 241 | 243.000 | 17 |
| 257 | 257.000 | 29 |
| 250 | 249.001 | 26 |
| 250 | 250.000 | 20 |
| 248 | 247.001 | 22 |
| 242 | 245.002 | 17 |

Blow

| Albino | Thompson | Printer | Remarks |
|--------|----------|---------|---------|
| 45 | OK | OK | |
| 46 | OK | OK | |
| 47 | OK | OK | |
| 48 | OK | OK | |
| 49 | Dis | | |
| 50 | OK | OK | |
| 51 | OK | OK | |
| 52 | OK | OK | |
| 53 | OK | OK | |
| 54 | OK | Cracked | |
| 55 | OK | OK | |
| 56 | Dis | | |
| 57 | OK | OK | |
| 58 | OK | Cracked | |
| 59 | Print | | |
| 60 | OK | OK | |
| 61 | Dis | | |
| 62 | Dis | | |
| 63 | OK | OK | |
| 64 | OK | OK | |
| 65 | OK | OK | |
| 66 | OK | OK | |
| 67 | OK | OK | |

| | | | | |
|----|------|------|---|---|
| 68 | OK | OK | * | |
| 69 | Dis | | |  |
| 70 | OK | OK | | <i>thin margin</i> |
| 71 | OK | (P) | |  |
| 72 | OK | OK | | <i>Ancho</i> |
| 73 | Dis | | | |
| 74 | OK | | |  |
| 75 | OK | OK | | <i>blister</i> |
| 76 | OK | OK | | <i>one side</i> |
| 77 | OK | (OK) | |  |
| 78 | OK | OK | | <i>bright</i> |
| 79 | OK | OK | |  |
| 80 | OK | OK | | |
| 81 | OK | OK | | |
| 82 | OK ? | OK | |  |
| 83 | OK | OK | | <i>blister</i> |
| 84 | OK | OK | | |
| 85 | OK | (OK) | |  |
| 86 | OK | OK | | <i>Ancho</i> |
| 87 | OK | OK | | <i>dull</i> |
| 88 | OK | OK | | |
| 89 | OK | OK | | |
| 90 | OK | OK | | |

4/27/14

90 blanks

Transformer

Prntg

Remarks

| | | |
|-----|------------|-------|
| 91 | OK | OK |
| 92 | OK | OK |
| 93 | OK | OK |
| 94 | OK | OK |
| 95 | OK | OK |
| 96 | OK | OK |
| 97 | OK | OK |
| 98 | OK | OK |
| 99 | OK | OK |
| 100 | OK | OK |
| 101 | OK | OK |
| 102 | OK | OK |
| 103 | OK | OK |
| 104 | Con | OK |
| 105 | OK | OK |
| 106 | to Halling | |
| 107 | to Halling | |
| 108 | to Halling | |
| 109 | OK | PAINT |
| 110 | OK | OK |
| 111 | OK | |
| 112 | OK | |
| 113 | OK | |
| 114 | OK | |



crack in blister 632-218

#632-218

632-218

632-218

Crack center

Crack center crack Van 632-218

Crack center crack Van 632-218

Crack center crack Van 632-218

Crack center crack Van 632-218

Crack center crack Van 632-218

Crack center crack Van 632-218

* lid raised quickly

1/2 DIA

90 blanks

Transformer

Prntg

| | | |
|-----|----|--|
| 115 | OK | |
| 116 | OK | |
| 117 | OK | |
| 118 | OK | |
| 119 | OK | |
| 120 | OK | |
| 121 | OK | |
| 122 | OK | |
| 123 | OK | |
| 124 | OK | |
| 125 | OK | |
| 126 | OK | |
| 127 | OK | |
| 128 | OK | |
| 129 | OK | |
| 130 | OK | |
| 131 | OK | |
| 132 | OK | |
| 133 | OK | |
| 134 | OK | |
| 135 | OK | |
| 136 | OK | |
| 137 | OK | |



crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

crack

632-208

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

" "

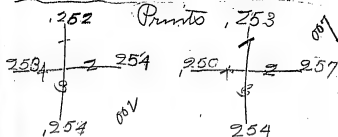
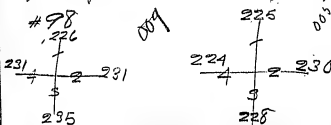
" "

" "

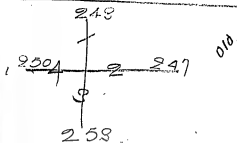
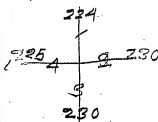
100

Special

blanks #98, 99, 100
lid with rubber fadd raised
quickly.



100



Powder test

4/29/14 at 9 AM 38.7%
 " 12 PM 50.7%
 " 3 PM 52.9%
 " 9 PM 49%

4/30/14 at 3 AM 48.7%
 at 9 " 45.2%
 at 11 " 46.7%
 at 2 PM 65.7%
 " 2.30 " 55%

4/30/14
 9 1/2 are now using powder 50% from

Powder test 801
 Salting Blanks 33.70%

(154)

1/30/14
 9th Barbo
 10th Barbo
 11th Barbo

Resistant

| | | |
|------|----|----|
| 138 | OK | OK |
| 139 | OK | OK |
| 140 | OK | OK |
| 141 | OK | OK |
| 142 | OK | OK |
| 143 | OK | OK |
| 144 | OK | OK |
| 145 | OK | OK |
| 146 | OK | OK |
| 147 | OK | OK |
| 148 | OK | OK |
| 149 | OK | OK |
| 150 | OK | OK |
| 151 | OK | OK |
| 152 | OK | OK |
| 153 | OK | OK |
| 154* | OK | OK |
| 155 | OK | OK |
| 156 | OK | OK |
| 157 | OK | OK |
| 158 | OK | OK |
| 159 | OK | OK |
| 160 | OK | OK |



small



bits and cracks



dark rock

bits and cracks

Big water



blister

(155)

blank has hard spot










←

154*

20

Adelphi
Immunum
Parasit

| | | | |
|-----|----|----|---|
| 161 | OK | OK | |
| 162 | OK | OK | |
| 163 | OK | OK |  crachia |
| 164 | OK | OK | |
| 165 | OK | OK | (B) blister and crachia |
| 166 | OK | OK | |
| 167 | OK | OK |  crachia |
| 168 | OK | OK |  crachia |
| 169 | OK | OK |  crachia |
| 170 | OK | OK | |
| 171 | OK | OK | |
| 172 | OK | OK | (B) blister and crachia |
| 173 | OK | OK | |
| 174 | OK | OK | |
| 175 | OK | OK | |
| 176 | OK | OK | |
| 177 | OK | OK | |
| 178 | OK | OK | |
| 179 | OK | OK |  crachia |
| 180 | OK | OK | |
| 181 | OK | OK | |
| 182 | OK | OK | |
| 183 | OK | OK |   |

No. 200

Sample

Paints

| No. | Sample | Paints |
|-----|--------|--------|
| 184 | Lois | |
| 185 | OK | OK |
| 186 | OK | OK |
| 187 | OK | OK |
| 188 | OK | OK |
| 189 | OK | OK |
| 190 | OK | OK |
| 191 | OK | OK |
| 192 | OK | OK |
| 193 | OK | OK |
| 194 | OK | OK |
| 195 | OK | OK |
| 196 | OK | OK |
| 197 | OK | OK |
| 198 | OK | OK |
| 199 | OK | OK |
| 200 | OK | OK |
| 201 | OK | OK |
| 202 | OK | OK |
| 203 | OK | OK |
| 204 | OK | OK |
| 205 | OK | |
| 206 | OK | |
| 207 | OK | |

flaking and cracking

9 flaking and cracking

Cracked

Cracked

Cracked



















(23)

Mrs Banks

Lumpkin

Punkin

5/1/14

| | | | |
|-----|---------------|---------------|--|
| 208 | OK | OK | |
| 209 | And | OK |  cracks |
| 210 | OK | OK |  cracked |
| 211 | OK | OK | |
| 212 | OK | OK | |
| 213 | OK | OK | |
| 214 | OK | — |  with cracked |
| 215 | OK | OK | |
| 216 | OK | OK |  cracks |
| 217 | OK | — |  cracks |
| 218 | OK | — |  cracks |
| 219 | OK | — |  cracks |
| 220 | OK | — |  cracks |
| 221 | OK | — |  cracks |
| 222 | OK | — |  cracks |
| 223 | OK | OK |  cracks |
| 224 | OK | OK |  cracks |
| 225 | OK | OK |  cracks |
| 226 | OK | OK |  cracks |
| 227 | OK | OK |  cracks |
| 228 | OK | OK |  cracks |
| 229 | OK | OK |  cracks |
| 230 | OK | OK |  cracks |



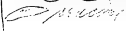

230

(129)

No. Bone














Number

Print

| No. Bone | Number | Print | |
|----------|--------|-------|---|
| 231+ | Dis | |   Dis |
| 232+ | OK | Dis |  |
| 233+ | OK | Dis | |
| 234+ | OK | Dis | Dis |
| 235+ | OK | OK |  crack |
| 236+ | Dis | | |
| 237+ | OK | OK | |
| 238+ | OK | OK | |
| 239+ | OK | OK | |
| 240+ | OK | OK | |
| 241+ | OK | OK | |
| 242+ | OK | OK | |
| 243+ | OK | OK | |
| 244+ | OK | OK | |
| 245+ | OK | OK | |
| 246+ | OK | OK | |
| 247+ | OK | OK | |
| 248+ | OK | OK | |
| 249+ | OK | OK | |
| 250+ | OK | OK | |
| 251+ | OK | OK | |

Light Work

No Blank
Transfer Print

| | | | | |
|-----|-----|-----|---|-----------------|
| 275 | Dis | |  | blank |
| 276 | Dis | |  | blank |
| 277 | OK | Dis |  | blister |
| 278 | Dis | |  | blister |
| 279 | OK | OK | | |
| 280 | OK | OK | | |
| 281 | Dis | |  | blister |
| 282 | OK | OK | | |
| 283 | OK | Dis | P. Print | |
| 284 | OK | OK | | |
| 285 | OK | Dis |  | crack |
| 286 | OK | OK | | |
| 287 | Dis | |  | crack and crack |
| 288 | Dis | |  | crack and crack |
| 289 | Dis | |  | crack and crack |
| 290 | Dis | |  | crack and crack |
| 291 | Dis | |  | crack and crack |
| 292 | Dis | |  | crack and crack |
| 293 | Dis | |  | crack and crack |
| 294 | OK | OK | | |
| 295 | OK | | | |
| 296 | OK | | | |

No Burbs

Jumper

Bombs

5/5/15

(7)

297 OK
 298 OK
 299 OK
 300 OK
 301 OK
 302 OK
 303 OK
 304 OK
 305 OK
 306 OK
 307 OK
 308 OK
 309 OK
 310 OK
 311 OK
 312 OK
 313 OK
 314 OK
 315 OK
 316 OK
 317 OK
 318 OK
 319 OK



Reiter cracked

Blank
member
Gumb

baked Blanks

320 OK
321
322
321 Dis
322 Dis
323 OK
324 OK
325 OK
326 Dis
327 OK
328 OK
329 OK
330 OK
331 OK
332 OK
333 OK
334 OK
335 OK
336 OK
337 OK
338 OK
339 OK
340 Dis
341 Dis



blank crackle
cracked


① → blister cracked


② → blister and cracked
③ → blister cracked


(12) C1342


Mr. Banks
Drammer
Dumb


342 OK
343 OK
344 OK
345 OK
346 OK
347 OK
348 No
349 OK
350 No
351 OK
352 OK
353 OK
354 OK
355 OK
356 OK
357 No
358 OK
359 No
360 No
361 OK
362
363
364 OK
365

 blisters cracked

 blisters and cracked

 blisters cracked

 blisters cracked

 blisters cracked

125 01053

366
367 OK
368
369 OK

[ITEMS(S) FOUND IN BOOK]

1913. (5) From N-13-12-08

Paulin—

(R)

Over in store house
where wood fibre is stored
there is an old dynamo
belonging to me, to get
it out please sign an
order that it is to be
shipped to J. V. Miller
Edison Chem works
Selosi Lake — its mixed
with your stuff —
Y. A. E.

[ITEMS(S) FOUND IN BOOK]

Wrote phoned
Mr. Buchanan 10/18
that he had found a
suitable motor at
Delon Lake, the price
was not required.

[ITEMS(S) FOUND IN BOOK]

Comments by William H. Hayss E 5791-4
insert
on notebook, N-13-12-08,
prepared for Adm. Harold G. Brown Farm N-13-12-08
N.R. Sporden
H.S. Anderson

Mr. Moore:

Experiment on Blank

8 December, 1913.

[ITEMS(S) FOUND IN BOOK]

This note book contains the recording of Mr. Thomas Edison while making experiments on the development of the original Edison disc record. It is in two parts; that dealing with the manufacture of the "blank" and that dealing with the blank surfacing on which the record was printed.

Mr. Moore, whose name is on the cover of the book was Sam Moore of Mr. Edison's "Insomnia Squad", a picture of which appears in the "Boy's Life of Edison", by Mr. Meadowcroft.

Explanatory Notes

The record, "blank" was molded from a powder whose composition was wood flower, chalk, lampblack and rosin.

The powder was made by dry mixing the woodflower, chalk and lampblack to which a wood alcohol solution of rosin was added. After further mixing this coarse mixture was vacuum dried to recover the alcohol. The coarse dry powder was then passed thru a ball mill which reduced it to a very fine dark grey flour. The flour was then ready to mold under steam heat and hydraulic pressure to form the blank which had a variable thickness of approximately one fourth inch. It was soft enough to scratch and during the printing process, which was done under higher pressure, was rendered to a thickness of approximately one-fifth inch.

The blank was surfaced with a varnish which in these experiments was first applied to a metal dish and dried. The blank was then sandwiched between two of these and heat and pressure applied. The varnish sheet in this manner was "transferred" to the blank as a veneer.

[Later the process was revised with the liquid varnish being applied directly to the blank. However, this was later than the time of these experiments.)

[ITEMS(S) FOUND IN BOOK]

2.

The Equipment

The mixing was done in what appeared to be a bread dough mixers. They were horizontal metal containers with a horizontal spiral mixing blades driven by electric motors.

The vacuum dryers were large metal ovens, cylindrical, with a swinging door on each end and with steamheated shelves. The wet powder was placed in two-inch depth sheet steel trays which were slid onto the shelves for vacuum drying.

The molding powder was placed by hand into the demountable mold which consisted of ring bottoms with center pin-hole and pin. For loading with loose powder an additional ring was employed to retain sufficient powder.

After filling the mold by hand and striking the powder off level with retainer ring, it was placed in the first press. This was a fast ram which operated upward by air pressure against a thick rubber pad. This operation expressed much of the air from the loose powder. The retainer ring was then removed and the compressed powder struck off level with the top of the mold. A thin retainer ring and the top were then placed on the mold and the powder was ready to be formed into the blank.

The molding was done in a press consisting of an upward moving hydraulic ram with a tier of steam-heated platens. The press mold held 12 molds.

The molding operation cycle was to first steamheat the molds, apply the pressure, chill the platens with cold water, remove the pressure and remove the molds with the molded blanks.

After removing the blanks they were ready for the surfacing process.

Page 1. Experiment (719 Blot of Powder.)

This batch of powder was put in the dryer for the noted time and then molded into blanks under 1,000 lbs. per square inch pressure while heated by steam at 10 lbs. per square inch.

The blanks were then veneered with condensate varnish by the transfer method, using a pressure of 800 lbs. per square inch, heated with steam at 80 lbs. per square inch. This was the veneered blank ready to be printed between record molds.

The other factors in the blank processing are not recorded.

X R.O. is the abbreviation for "Run Out". It means that the music "runs out", or fades out, due to areas of light printing. X

Page 11. The "Rotating disc" probably consisted of radial blades used in striking of surplus power from the mold. This type of strike-off equipment later became standard.

[ITEMS(S) FOUND IN BOOK]

Page 3.

Page 3: "Tapping" probably refers to the method of tapping the loose powder filled mold to consolidate the same before striking it off. This consolidating method was later abandoned for the air ram method.

"Pull Out" means that when the printing mold was separated a portion of the surface stuck to the mold and was "pulled out" from the finished record.

Page VI. "Blasts" means that the fidelity of the music was lost due to the skidding of the needle in the music groove. This was probably due to the speaker not being able to record loud music at that record speed.

To polish was to run the record under a rotary brush. This would reduce the blast as it would reduce the printing depth.

Page VII. "Knocks", "crackles" and "Scratched" and "Rough Surface", due usually to defective surfaced blank. "Run outs" and "Bad prints" usually due to blanks having low density areas.

"Cracked" - Records in process sometimes developed cracks radiating from center hole due to central circumferential stresses produced by radial flow of the record under high pressure.

Records sometimes developed circumferential cracks, near the edge. These areas later designated as "Parallel cracks" - (parallel to edge). These were due also to the radial flow of the record under pressure.

The writer determined (quite by accident in 1922) that these were caused primarily by too high moisture in the powder which adversely affected the molding characteristics.

Page XII. The test recorded on this page does not determine whether defects arose from the printing mold or the surfaced blank. Last line reads "Rouge" (i.e. rouge polishing powder) " and I think kerosene."

[ITEMS(S) FOUND IN BOOK]

Page 4.

Page XIII. These are diagrams of the music grooves as noted radially across the record. A "knock" is a surface defect which, if it extends across several grooves, causes the knock to repeat.

"Buckles" were wrinkles in the surface caused probably by flow of varnish under heat and pressure.

Pages XIV - XVIII. Nature of this test not understood by writer.

Page XX. Edison apparently concludes that defects in records may arise from dirt particles on printing mold and on blank. Washing mold corrects the former.

Page XXII. "Surface Velvet" good" - means absence of noise arising from scratchy surface characteristic.

Page XXIII. Blanks surfaced with celluloid instead of those preceeding which are presumed to be finished with condensite.

Page 32. "Tits on Blank" are presumed to be particles of blank varnish material extending above the surface. With sufficient heat this would soften and mold into varnish surface. With insufficient - they would cause defect in record.

4 weve
"Top not in Contact with next Plate". This means that the press-rams was not operated to raise the mold to make contact with the platen above.

This test was to determine if heat alone would cause the tits to mold into the blank.

Page 33. Concludes from tests that sufficient heat reduces the hazard of printing mold defects caused by tits on blank.

Difference in mold temperatures could have arisen from location in the press or the length of time in the press. This is the thought behind Mr. Edison:
"Inquire how they were taken out."

[ITEMS(S) FOUND IN BOOK]

Page 5.

Page 34. The "Labels" mentioned here and on previous pages were impressed in the varnish. Later, because of the high rate of defective label printing, paper labels were substituted.

Page 38. "2 Heat - 3 Contact". This is the operation schedule; heat platens 2 minutes then raise ram until contact is made with platten above where it was held for 3 additional minutes.

Page 39. Note last two lines: "Would be O.K. were it not that blanks are irregular". This indicates that the blank production method was unsatisfactory. The method used is not disclosed in this note book.

Page 41. This is the test that tried out the blank production method finally adopted.

The diagram shows the mold ring, bottom and top ring. The top steel plate and rubber pad were attached to the head of the vertically operated air ram.

Page 42. This device was tested to remove the surplus powder shown in diagram Page 41.

Page 43. This page may be clarified as follows: The thought of this experiment is to find a good way to smooth off the surplus powder after it has been compressed by the rubber pad during the ram operation and (2) to find method to prevent powder sticking to the pad at the end of the operation and (3) to get it to operate commercially and cheap.

Page 44. This shows the coordinates of a blank with marginal thickness in thousandths of an inch, as measured by micrometer callipers.

[ITEMS(S) FOUND IN BOOK]

Page 6.

Page 49. The fixed rotary scraper was adopted for production with the loaded mold conveyed to it on a rotating table.

Page 50. The irregular areas shown on blank diagram were areas which did not print satisfactorily. They will appear on many pages which follow. The cause was an uneven distribution of material; blank and veneer. Often areas are noted as discollocations - red especially.

The uneven distribution of material in the blank was usually caused by what were known as "Tear outs". Apparently they were not noted in these tests, altho they appear to have been present.

"Tear Outs" were areas where the scraper tore out powder below the level of the ring. When molded these produced soft spots which were unnoticeable to the eye, but which would cause Run Outs on printing. The primary cause was too rapid release of the air ram which blistered the powder in the mold prior to its being scraped.

Page 52. This is the first of blanks completed as records.

Page 53. In this case the rubber pad used in connection with the air ram was not cemented to the ram head. It was placed on and removed from the mold before and after that operation.

Page 54. First paragraph indicates the scraper had insufficient length to remove all the surplus material from the mold. Second paragraph is not intelligible.

Page 55. Start of tests using 779 varnish. Character of varnish not recorded.

Page 55. Start of tests on Lot 632 varnish. Character of varnish not recorded.

[ITEMS(S) FOUND IN BOOK]

Page 68. "It pulled up surface near edge somewhat badly". This is first indication of uneven distribution material in blank due to faulty operation at this point. Its significance seems to have escaped notice. Page 7.

Page 70. - Note same, "only 2 or 3 slight raises"

Page 786 - Start of series of tests on 12 blanks (#32 - #44) from blanks thru printing.

Page 110 - Summary of same.

Page 112 - Tests on loading powder into mold by means of a straight scraper. This operation was done by hand. This was the later production method.

Page 113. Tests on processing powder in mold ready for going to presses.

Pages 116 - 125. Record of test blanks 45 - 369 thru transfer and printing.

Notebook Series -- Notebooks by Edison
Notebook, N-19-04-20.1

This undated notebook was probably used by Edison during the period 1913-1914; several of the entries were annotated in June 1926. All of the entries and notations are by Edison and pertain to the construction, electrical capacity, and efficiency of his alkaline storage batteries. Most of the entries contain data and observations, probably transcribed from earlier notebooks, regarding numbered cells made with experimental iron "pockets" or negative electrodes. Also included are notes, probably transcribed from earlier notebooks, pertaining to experiments made with various electrolyte solutions and positive electrode "tubes" and to tests made under different charge and discharge conditions. Among the earlier notebooks consulted are N-06-09-05, N-10-02-24, and N-10-10-31. The notations from 1926 consist of brief observations about specific data, along with disparaging remarks about former employee Dr. Otto Grothe. The front cover is labeled "Very Important." The pages are unnumbered. Approximately 50 pages have been used.

Iron mix. Various.

5 Hourly 300 Ma-

| | # | Capacity gms (Rack) 5 Hours | Grms | Volt eff | amp eff | Watt eff |
|---|------|-----------------------------------|------|-------------|------------|-------------|
| 80 Fe 15 Cu 5 Zn 5% H ₂ O Non Pyro | 3013 | 1210 | 5 | 73 | 80.6 | 58.8 |
| | 3014 | 1255 | 5 | 73.9 | 83.6 | 61.7 |
| Ditto Self heated | 3015 | 1170 | 5 | 73.4 | 78 | 57.2 |
| | 3016 | 1147 | 5 | 73.5 | 76.5 | 56.2 |
| 60 Fe 40 Cd 5 H ₂ O non pyro | 3023 | 1340 | 5 | 74 | 89.3 | 66.1 |
| | 3024 | — | 5 | — | — | — |
| 60 Fe 40 Cd no H ₂ O Non Pyro | 3025 | 1335 | 5 | 75.1 | 89 | 66.8 |
| | 3026 | 1297 | 5 | 75.5 | 86.5 | 65.3 |
| 80 Fe 20 Cu 5 Sn 5 H ₂ O Self heated | 3027 | 1035 | 5 | 75.1 | 69 | 51.8 |
| | 3028 | 1042 | 5 | 74.5 | 69.5 | 51.7 |
| 90 Fe 10 W 5 H ₂ O non Pyro | 3219 | 1165 | 5 | 73.2 | 77.6 | 56.8 |
| | 3220 | 1150 | 5 | 73.1 | 76.6 | 56 |
| Ditto | 3221 | 1150 | 5 | 73.7 | 76.6 | 56.4 |
| Self heated | 3222 | 1090 | 5 | 72.6 | 72.6 | 52.7 |
| 80 Fe 15 Cu 5 Sb 5% H ₂ O Self heated | 3235 | 1275 | 5 | 75.3 | 85 | 64 |
| | 3236 | 1285 | 5 | 75.3 | 85.6 | 64.5 |
| Ditto | 3249 | 1250 | 5 | 74.5 | 83.5 | 62.2 |
| Non Pyro | 3250 | 1295 | 5 | 74.9 | 86.3 | 64.6 |
| 85 Fe 15 W 5 Yellow bronze | 3269 | 1092 | 5 | 74.1 | 72.8 | 53.9 |
| | 3270 | 1150 | 5 | 74.6 | 76.6 | 57.1 |
| 90 Fe 10 W 5% H ₂ O | 3275 | 1215 | 5 | 75.1 | 81 | 60.8 |
| Dr.G. non pyro | 3276 | 1125 | 5 | 75.2 | 81.6 | 61.3 |
| 85 Fe W 15 5% H ₂ O | 3281 | 1100 | 6 | 75 | 73.3 | 54.9 |
| Blue bronze Non Pyro | 3282 | 1092 | 6 | 75.1 | 72.8 | 54.6 |

3335
3336

14% NaOH
ampacity
88.3
88.8

| | # | Cap | Gms | V4cy | ampacity | Rating |
|---|------|------|------|------|----------|--------|
| 80 Fe 15 Cu 5 Cd 5% H ₂ O Non Pyro | 3283 | 1087 | 5.5 | 75 | 72.5 | 54.3 |
| | 3284 | 1087 | 4.5 | 76.6 | 72.5 | 55.6 |
| 70 Fe 30 Wo. yellow bronze 5% H ₂ O Non Pyro | 3289 | 1017 | 5 | 74.3 | 67.8 | 50.3 |
| | 3290 | 1097 | 3.5 | 74.9 | 73.1 | 54.7 |
| 80 Fe 15 Cu 5 Cd 5% H ₂ O Self heat | 3291 | 1022 | 5.5 | 76.7 | 68.1 | 52.2 |
| | 3292 | 1040 | 4 | 76.8 | 69.3 | 53.2 |
| 80 Fe 20 Sb from oxidation 5% H ₂ O Non Pyro | 3295 | 1180 | 5 | 73.3 | 79.6 | 58.3 |
| | 3296 | 1175 | 4 | 72.9 | 78.3 | 57.1 |
| 80 Fe 20 Wo yellow bronze 5% H ₂ O Non Pyro | 3299 | 1115 | 5 | 73.7 | 74.3 | 54.7 |
| | 3300 | 1062 | 4 | 74 | 70.8 | 52.3 |
| 75 Fe 25 Wo. blue bronze 5% H ₂ O Non Pyro | 3313 | 1115 | 5 | 74.7 | 74.3 | 55.5 |
| | 3314 | 1045 | 3.75 | 74.5 | 69.6 | 51.8 |
| 75 Fe 25 Wo. yellow bronze 5% H ₂ O Non Pyro | 3315 | 1092 | 5 | 73.6 | 72.8 | 53.6 |
| | 3316 | 1090 | 3.75 | 74.3 | 72.6 | 53.9 |
| 80 Fe 20 Wo. yellow bronze 5% H ₂ O Self heated org | 3319 | 1080 | 5 | 74.3 | 72 | 53.5 |
| | 3320 | 1147 | 5 | 74.5 | 76.5 | 57 |
| 75 Fe 25 Wo blue oxide 5% H ₂ O Self heated org | 3333 | 1030 | 5 | 74.2 | 68.6 | 50.8 |
| | 3334 | 1100 | 3.75 | 75 | 73.3 | 54.9 |
| 90 Fe 10 Wo 5% H ₂ O Org | 3335 | 1295 | 5 | 76.2 | 86.5 | 65.9 |
| | 3336 | 1310 | 4.5 | 76.6 | 87.3 | 66.8 |
| 90 Fe 10 Wo 5% H ₂ O Red bronze - non pyro org | 3337 | 1160 | 6 | 75.1 | 77.3 | 58.1 |
| | 3338 | 1150 | 5.4 | 73.9 | 76.6 | 56.6 |
| 85 Fe 15 Sb. 5% H ₂ O Non pyro | 3341 | 1195 | 5 | 74.4 | 79.6 | 59.1 |
| | 3342 | 1170 | 4.25 | 74.4 | 78 | 58.1 |

16% NaOH.
amp Eley

| | |
|------|------|
| 3351 | 81.6 |
| 3352 | 82 |
| 3359 | 80.6 |
| 3360 | 82.1 |
| 3369 | 81 |
| 3370 | 84.6 |
| 3377 | 86 |
| 3378 | 85 |
| 3389 | 85.3 |
| 3390 | 85 |
| 3397 | 89 |
| 3398 | 89 |
| 3391 | 85.5 |
| 3322 | 87.3 |

Adding up total Watt
Efficiency + dividing by the
non pyro + self heated as far as
now recorded gives

Watt Eley Self heated 55.84%
" Non Pyro 57%
Amp Eley Self H 74.66
" " Non Pyro 79.

| | # | Cap | grms | V/Ely | amp Ely | Watt Ely |
|----------------------------------|------|------|------|-------|---------|----------|
| 80 Fa 20 Wo blue oxide | 3343 | 1167 | 5 | 75.9 | 77.5 | 59 |
| 5% H ₂ O Self heat | 3344 | 1160 | " | 75.6 | 77.3 | 58.4 |
| 95 Fa 5 Wo blue ox | 3349 | 1085 | 5 | 73.4 | 72.3 | 53 |
| 5% H ₂ O Non Pyro | 3350 | 1040 | 4.5 | 73 | 69.3 | 50.6 |
| 95 Fa 5 Sb. 5% H ₂ O | 3351 | 1112 | 6 | 75.6 | 74.1 | 56 |
| Non Pyro | 3352 | 1125 | 5.15 | 75.8 | 75 | 56.9 |
| 90 Fa 2 Wo 10 blue | 3359 | 1097 | | | 73.1 | |
| Self heat | 3360 | 1110 | | | 74 | |
| 80 Fa 15 Cu 5% H ₂ O | 3369 | 975 | | | 65 | |
| Dr G 141 | 3370 | 1172 | 4 | 74.2 | 73.1 | 57.9 |
| 75 Fa 25 Wo yellow bronze | 3375 | 1025 | | | 68.3 | |
| 5% H ₂ O | 3376 | 1030 | | | 68.6 | |
| Self heated | 3377 | 1160 | | 74.1 | 77.3 | 57.3 |
| 75 85 Wo 15. H ₂ 5% | 3378 | 1125 | | 74.8 | 75 | 56.1 |
| Self heated | 3387 | 1035 | | | 69 | |
| 80 Fa 20 Wo 20 Red bronze | 3388 | 1050 | | | 70 | |
| 5% H ₂ O | 3389 | 1160 | | 72.7 | 77.3 | 56.1 |
| Self heat | 3390 | 1157 | | 73.1 | 77.1 | 56.3 |
| 90 Fa 2 Wo 5 5% H ₂ O | 3397 | 1200 | | 73.9 | 80 | 59.1 |
| Self heated | 3398 | 1240 | | 73.3 | 82.6 | 60.5 |
| Non Pyro | 3405 | 1125 | | 75.2 | 75 | 56 |
| 95 Fa 5 Sb Self | 3406 | 995 | | — | 66.3 | 51.1 |
| 95 Fa 2 Wo 5 H ₂ 5% | 3417 | 1175 | | 74.6 | 78.3 | 58.4 |
| Self heat. | 3418 | 1012 | | | | |

3591-2chqd 300 3.5 hours

x 4 hours chq at 300

3 hours chq at 300

3475 gives 449 mah per gram
3495 Ferrous Ammon Sulfate self heated
gives 286 mah per gram

80 Fe 20 Cu non pyro 447 mah to gram

3855 Ferrous Ammon Sulfate fused

3856 Self heat heat 4 gram 1570
3857 66.8 Watt-sec
3858 69.4

3869 Cupric Ferrous Ammon sulfate fused
355 to gram 68.5 Watt-sec
self heat heat,

| | # | Cap | Gms | V Etc | Am Sg | Watt-sec |
|---------------------------------------|------|------|-----|-------|--------|----------|
| 80 Fe 20 Cu 5 H ₂ O | 3491 | 1047 | 4 | 74.4 | 87.2 | 64.9 |
| Lo. 14 non pyro | 3492 | 1012 | | 74.8 | 84.4 | 63.1 |
| 80 Fe 20 Zinc 5 H ₂ O | 3497 | 1042 | 4 | 76.3 | 86.8 | 66.2 |
| 4 Lo. self heat | 3498 | 1074 | | 74.3 | 85.8 | 63.7 |
| 80 Fe 20 Cu 5 H ₂ O | 3591 | 887 | 3.5 | 75.6 | 84.5 | 63.9 |
| W. 6. non pyro | 3592 | 892 | 3.5 | 75.2 | 85 | 63.9 |
| Lo. 80 Fe 20 Tin - 5 H ₂ O | 3481 | 1007 | 4 | 75.4 | 83.8 | 63.5 |
| 4 Lo. non pyro | 3482 | 995 | 3.5 | 75.9 | 82.9 | 62.9 |
| 1 Ferrous Ammon Sulfate | 3475 | 767 | 3 | 76.8 | 85.3 | 65.5 |
| Lo. 1 non pyro | 3476 | 770 | | 75.6 | 85.6 | 64.7 |
| 80 Fe 20 Cu 5 H ₂ O | 3607 | 952 | 3.5 | 75 | (90.7) | 68.1 |
| W. 11 non pyro | 3608 | 955 | | 75.4 | 91 | 68.9 |
| 80 Fe 20 Cu 5 H ₂ O | 3609 | 1050 | 4 | 76.2 | 87.5 | 66.7 |
| W. 11 self heat | 3610 | 1080 | | 75.2 | 90 | 67.8 |
| 80 Fe 20 Cu 5 H ₂ O | 3595 | 1245 | 5 | 73.5 | 83 | 61 |
| W. 7 non pyro | 3596 | 1275 | | 74.1 | 85 | 63 |
| 80 Fe 20 Cu 5 H ₂ O | 3597 | 1217 | 5 | 75.4 | 81.1 | 61.1 |
| W. 7 self heat | 3598 | 1197 | | 73.8 | 79.8 | 58.9 |
| 80 Fe 20 W 20 5 H ₂ O | 3659 | 1285 | 5 | 75.8 | 85.6 | 64.9 |
| G. 10 self heat | 3660 | 1275 | | 75.4 | 85 | 64.4 |

Greater viscosity of NaOH. at 15 than KOH at 21 having same molecules shows NaOH. is very hydrated & by new theory a better conductor.

Viscosity at 25% of KOH & NaOH.

Water = 32.6 average temp.

| % NaOH | 1st Time in temp. | 2nd Time | average time in seconds | Viscosity | Specific gravity |
|--------|-------------------|----------|-------------------------|-----------|------------------|
| 15 | 36.2 | 36 | 36.1 | 1.1074 | 1.166 |
| 17 | 37.2 | 37.2 | 37.2 | 1.1411 | 1.188 |
| 19 | 38.4 | 38.4 | 38.4 | 1.1781 | 1.209 |
| 21 | 39.6 | 39.8 | 39.7 | 1.2178 | 1.232 |
| 23 | 40.6 | 40.8 | 40.7 | 1.2484 | 1.254 |
| 25 | 42.8 | 42.4 | 42.6 | 1.3067 | 1.275 |
| 27 | 45 | 45 | 45 | 1.3809 | 1.290 |
| 33 | 61.2 | 61.2 | 61.2 | 1.8466 | 1.359 |

| KOH | | | | | |
|-----|------|------|------|--------|-------|
| 9 | 32.6 | 32.4 | 32.5 | 0.9966 | 1.070 |
| 11 | 32.4 | 32.6 | 32.5 | 0.9966 | 1.088 |
| 13 | 32.6 | 32.8 | 32.7 | 1.0030 | 1.107 |
| 15 | 33 | 32.6 | 32.8 | 1.0061 | 1.124 |
| 17 | 33 | 33.2 | 33.1 | 1.0153 | 1.142 |
| 19 | 33.2 | 33.4 | 33.3 | 1.0215 | 1.162 |
| 21 | 33.8 | 33.6 | 33.7 | 1.0337 | 1.184 |
| 23 | 33.6 | 33.6 | 33.6 | 1.0307 | 1.204 |
| 25 | 34 | 34 | 34 | 1.0429 | 1.225 |
| 27 | 34.4 | 34.4 | 34.4 | 1.0552 | 1.247 |
| 33 | 35 | 35 | 35 | 1.0736 | 1.319 |

Capacity to 1 Volt 5 hour chg 300 Ma -
of $\frac{1}{2}$ in NaOH

16% NaOH.

| | Gr Run | Voltage | amp/eq | Watt/eq |
|------|--------|---------|--------|---------|
| 2930 | 1380 | 74.6 | 92 | 68.6 |
| 2931 | 1350 | 72.9 | 90 | 65.6 |
| 3023 | 1345 | 73.6 | 89.6 | 65.9 |
| 3025 | 1317 | 72.1 | 87.8 | 63.3 |
| 3026 | 1310 | 74.5 | 87.3 | 65 |
| 3143 | 1272 | 73.7 | 84.8 | 62.5 |
| 3144 | 1290 | 74.7 | 86 | 64.2 |
| 3145 | 1275 | 74.7 | 85 | 63.5 |

21% NaOH.

| | | | | |
|------|------|------|------|------|
| 3195 | 1400 | 73.4 | 93.3 | 68.4 |
| 3196 | 1440 | 74.8 | 96 | 71.8 |
| 3235 | 1400 | 73.4 | 93.3 | 68.4 |
| 3236 | 1387 | 73.3 | 92.5 | 67.8 |

13% NaOH.

| | | | | |
|------|------|------|------|------|
| 3213 | 1357 | 71. | 90.5 | 64.3 |
| 3214 | 1360 | 72.4 | 90.6 | 65.6 |
| 3249 | 1190 | 72.9 | 79.3 | 57.7 |
| 3250 | 1250 | 73 | 83.3 | 60.8 |

*
40 + 50 about the same, but
after 75 amp 50 rate goes above

| | | | |
|----|-----|----|-------|
| at | 100 | to | 105 |
| | 125 | " | 110 |
| | 150 | " | 114 |
| | 175 | " | 116.5 |
| | 200 | " | 118 |
| | 225 | " | 120 |

If we charge a E18 at
30 amp then at end 225 amp it will be 12° above Atmos
40 " 17.5°
50 " 23.7°

It is very desirable to charge at
low rate for heat reasons



Blank Grids in E18 - Temperatures
produced by passing 30 40 + 50 amp
thru 21% KdH 30 amp rate

| Temp air | Temp cell | Amp/hour | Difference |
|----------|-----------|----------|------------|
| 73 | 72.5 | | = 3 |
| 75 | 84.5 | 25 | + 9.5 |
| 75 | 94 | 50 | 19 |
| 74.5 | 98 | 75 | 22.5 |
| 73 | 101.5 | 100 | 28.5 |
| 76.5 | 105.2 | 125 | 28.7 |
| 78 | 108 | 150 | 30 |
| 80 | 111 | 175 | 31 |
| 80.5 | 112 | 200 | 31.5 |
| 80.5 | 114 | 225 | 33.5 |

*

E18. Cell discharge 30 amp rate
 it was chgd 8 hours 30 amp.
 Flood over night to cool to normal

| Air Temp | Cell Temp | Amp | Dif |
|----------|-----------|-----|-------|
| 72.5 | 71 | 0 | = 1.5 |
| 71.5 | 74.5 | 25 | + 3 |
| 73 | 78 | 50 | 5 |
| 73.5 | 83 | 75 | 9.5 |
| 74 | 86.5 | 100 | 11.5 |
| 76.5 | 90 | 125 | 13.5 |

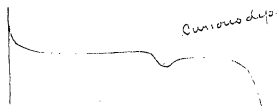
Above cell only gave 124 amp to 1V

F

Fe = 534 A-

Discharged at 300 ma after long charge

| Normal Temp discharge | 110° disch | 121° | 135° |
|-----------------------|------------|------|------|
| 1350 | 2575 | 3000 | 2575 |



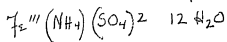
Extra capacity is below 1.15 Volts

Cell No 597 Short chg

If charged normal + discharged at 135°
 it gives a higher capacity + 3/100 higher
 voltage, than if charged + dischd normal

If charged at 135° + dischd normal
 capacity is only 65% of the charged
 normal, voltage is less, than 1.18 average
 against 1.27 See next page

Iron Alum, enormous quantities used in dyeing



Colorless crystals, crystals scarcely

It is Ammonio Ferric sulphate

This on ignition should give very porous iron, having 12 waters

Ferricous NH₄SO₄ only 6 waters,

Yellowish sediment on the head
rubber of cells is a very basic
iron sulphate,



Long charge

The discharging voltages in this case are about the same.

But the cell charged not has 5% less capacity than chg + dischg normal + chg + dischg test.

The long charge acts entirely different from short charge. Why?

Experiments with C.P. Nickel strips and
regular ions, with, and without dithia in
the KOH.

6457. 21% 2 grms LiOH each cell
6458 " 3 "
6459 " Saturated
6460 " 1 gram "
6461 33% alone
6462 21% alone

24 hours changed - all nickel strips slightly
tinted

24 hours Reversed strip had on

| | | |
|------|----------------------|---|
| 6457 | 0.0069 $\frac{7}{8}$ | second checker 33% has quite a deposit of X on all others had deposits but not so much 1 gram dithia is next to 33%. 58+57 quite small |
| 6458 | 0.0078 $\frac{7}{8}$ | |
| 6459 | 0.0135 $\frac{7}{8}$ | |
| 6460 | 0.0092 $\frac{7}{8}$ | |
| 6461 | 0.0200 $\frac{7}{8}$ | |
| 6462 | 0.0080 | |

21% only a little as 6459 is equivalent in ions
to 33%, nearly it tends to show dithia helps
to diminish X deposit.

over

Note, Brightness may be due to Mercury

6459 }
6461 } is attacked very slowly by dilute HCl.
6462 } kept at nearly boiling heat
as 6462 clears up in the acid it resembles
in appearance exactly 6459 when first
taken out so all the deposits ⑩ 6459
6461 6462 are the same.
It certainly looks as if the deposits were
partially amalgamated. This would
account for the brightness of the strips & in the case
of 6461 & 6462 the deposit was not sufficiently
adhered with Mercury to make them bright
whether thing is slow action in HCl which may be
explained by Mercury. It looks as if lithia
favors amalgamation of Nickel surfaces in Alkali
& thus gives loose deposits of deleterious material
& loosens old deposits = 6459 after 1/2 hour nearly
boiling is now bright, frost by rubbing slightly
with finger its silver like showing that it is amalgamated
hence lithia conduces to amalgamation & holds the
Mercury in the vion & also evidently removes
some sulfur that is not removed by HCl alone
otherwise Nickel strips wouldn't amalgamate

2nd Reverse

6457 - Very bright no gas on HCl. opens on acid, of the char.
6458 "
6459 Brightest deposit gray, shows small crystals
6460 Very slight brownish deposit, not as much as 6459
6461 Black heavy deposit, not so much as 6461
6462 " " not so much as 6461

After 1 hour in acid 6461-2 still had
dull grey deposit, had to polish off with
rag which got black from 6461 which
has more deposit on of this grey than
6462 although it looked brighter
scarcely a sign of amalgamation, so no
Hg under microscope.

Do far the results would indicate
1st Lithia keeps Hg on vion & prevents migration
on reverse, hence vion don't go into solution
on dischg & permit deposit of oxide inside tube
possibly Hg hold Co & other metals back in vion

OVER

2nd I should call get reversed very little Fe goes over & considerable Hg which wants to follow the Fe. Only seam or film of stuff forming on Nickel tube is loosened up by tendency of lithia to cause amalgamation. Without lithia considerable iron migration & scarcely any Hg. which is the reverse when lithia used.

○

Remarks: that I thought nickel was as of valuable in KOH containing lithia

2nd Reverse 40 hours Ni strip as cathode

| | |
|----------|----------|
| 6457 | •0079 Fe |
| 6458 | •0037 |
| 6459 | •0075 |
| 6460 | •0080 |
| not 6461 | 0360 |
| 6462 | 0105 |

○

Nickel strip Anode 80 hours

| | | |
|------|-----------|---------------|
| 6457 | Pink Tint | Very light |
| 6458 | " | in spots |
| 6459 | " | " |
| 6460 | " | Very light |
| 6461 | " | " |
| 6462 | Blood red | deep like red |

Lacquer

All the colors came off instantly on dipping in water containing H_2O_2 . Water appeared a little pinkish. Dr G says only trace Mn but think his test N.G.

○

3rd Chge Ni strip Cathode

| | | | |
|------|-------------------------|------|----------------|
| 6457 | } Bright, Hg recathodic | 6461 | } dark coating |
| 6458 | | 6462 | |
| 6459 | | | |
| 6460 | | | |

6461 thickest coat all but 61+62 clear up bright after air oxidation, 61+62 don't clear in 5 mins. All the iron grids purple. When Ni strips taken out H_2O runs off as if greasy. Purple is either Mn or Rubbers compound

Appearance of a lot of little test cells

5775 } 1/2 gray - tubes light yellow brown incrusts
 5776 } 1/2 gray - Tube lighter color - has complete
 5777 } same - 5775 - tubes yellow, crystal on inside part

5/18

There are 6 or 8 pages in a general note book describing condition of tubes & grids of test cells (small) too long to copy -

ways rubber holding Fe-Ni a bottom is coated with mercury. Micro shows fine globules & states that it is certain there is a high resistance short circuit in many of the cells - Also many have fine crystals on tubes & other parts - Crystals disappear when Elements put in Water.

Equivalent Ions

9% LiOH 15% NaOH 21% KOH,
 38 1/4% RbOH. 56.25% CsOH.

Weight of Ni plate in A4 -

483 Grms 1 lb 1 oz

Absorption of water by reg iron mix

Dried at 212° then

Allowed to stand in air saturated with moisture

| moisture | absorbed | 6 milg |
|----------|----------|--------|
| 15 min | " | 8 |
| 30 " | " | 9 |
| 45 " | " | 11 |
| 75 " | " | 14 |
| 105 " | " | 14 |
| 135 " | " | 14 |
| 225 " | " | 17 |
| 315 " | " | |

Total absorbed in 5 hours 15 min
 17 milg 0.56%

Ferrie Sulphate is the only known sulphate valuable in electrof.

2860 = Strip perforated + half width of pocket used. pocket $\frac{1}{2}$ filled then strip put in + other $\frac{1}{2}$ mix put in - strip bent to pocket to give contact

1st Run 1290
1180

2nd Run 1262
1060

no gain.

3061 Req $\frac{1}{2}$ mix dampened with water
3062 so just holds together when squeezed
made into cakes $\frac{1}{4}$ thick, pressed 300 atmos
dried on hot plate $\frac{1}{2}$ hour, then crushed
+ sieved thru 20 mesh.

gives 1375 but after many runs goes to 1250
1400

Dr Crocker was a Crocker
independent

3063 S.G. - 90% 10 Sb 5/14g non pyro
3064

The pockets swelled terribly +
burst - Strange.

3083 - No 2993
3084 -

Non pyro - Ferrous Sodium sulphate 250 atmos
pressing + corrugating

Heavy pressure kills it only gives
78% to Volt. after reversal improved to
1420
1232

Ferrous Ammonium sulphate fused is
liable to have sulphur

3143-4 Has highest amp specy 93.4
long chq 1470 short 1400 - its
Ferrous Sodium Sulphate not self heated
5% H₂O smooth wires 100 at Corrugated 25 atmos.

Oxide of Cadmium in tubes run as Fe.
Weights 10514 - 10432

50th Run 1V $\frac{1}{2}$ V
420 430
425 435

We now June/26 get with 5 gram
Pkt 1850 Req

Cadmium metal reduced by Zinc
put in tubes with flakes & run as Fe.

| Weight | 50 Run 1 V | 1/2 | 400 th Run |
|--------|------------|------|-----------------------|
| 15.770 | 855 | 930 | 2200 3425 |
| 16.110 | 1160 | 1285 | 2200 3425 |
| | | | 2440 3790 |

450th Run

| 1 V | 1/2 | |
|------|------|--------------------|
| 1790 | 3040 | |
| 1740 | 2975 | gives only 162 MAH |
| 2000 | 3325 | per Gram |

Reg Fe mix pressed into cakes
at 300 Atmos. put in pockets: loose-
not crumpled or Corrugated.

| 1 Volt | 50 th Run | Hot |
|--------|----------------------|-----|
| 30 | 75 | 275 |
| 60 | 100 | 275 |



June 1st 1926 -
looks like bad
contacts will
pocket -

Ferric ion from igniting FeNO_3 or
Magnetic oxide from the reduction of
wet ferric hydroxide gives no
current at all - when not reduced.

Req Sb₂O₃ iron pockets 005 stock

Cramped only

| | | |
|------|------|-----------|
| 1V | 1/2 | |
| 2365 | 3010 | } 75 Fahr |
| 2570 | 3595 | |

| | |
|------|-----------|
| 1675 | } 35 Fahr |
| 1760 | |

loaded in 003 stock

Cramped only between flat surfaces, not req die

| | | |
|------|------|-----------|
| 1V | 1/2 | |
| 2400 | 3605 | } 75 Fahr |
| 1550 | 2365 | |

| | |
|------|-----------|
| 1695 | } 35 Fahr |
| 1090 | |

Iron Fe₂O₃ from Silver Lake screened thru 100 mesh reduced in hydrogen
Hydrogen replaced by Nitrogen cold.
10% H₂O - wt 8,380 - 8,670 -

| | | |
|------|------|-----------|
| 1V | 1/2 | |
| 2880 | 4225 | } 75 Fahr |
| 2970 | 3970 | |

note 1/2 V
4 35 Fahr

| | | |
|------|------|-----------|
| 1930 | 1880 | } 35 Fahr |
| | 1880 | |

Duplicate

| | | |
|------|------|-----------|
| 1V | 1/2 | |
| 2630 | 3990 | } 75 Fahr |
| 2600 | 3990 | |

5/2970 371 ml amp
per gram

| | |
|------|-----------|
| 1780 | } 35 Fahr |
| 1360 | |

Repeat these Expts
A4 Cell for Cold test

7/7/54
100
100

Reg Storage bat 7/2
81250 grms.

annealed, crimped + Corrugated
1 1/2
2025 2840 75 fahr 1440 35 fahr

annealed + crimped only - 8500 grms
75 fahr 35 fahr
1 1/2 1 V
2280 3390 1665

annealed, crimped + Corrugated
7000 grms
75 fahr 35 fahr
1 1/2 1 V
1950 2850 1330

annealed + crimped only 7800 grms
75 fahr 35 fahr
1 1/2 1 V
2230 3320 1655

Note, Corrugated bad cold,
more than the difference at 1 volt.

Crimped + annealed 8600 waf
75 fahr 35 fahr
1 V 1/2 1 V
2500 3885 1925

Crimped annealed + Corrugated 8350 waf
75° 35°
1 V 1/2 1 V
2100 2970 1445

Annealing was done in slip stream
at Battery Co - Crimping 15 atmos
Corrugating 200 atmos

Calliper

| Top | middle | Bottom |
|-----|--------|--------|
| 112 | 112 | 109 |
| 118 | 116 | 112 |
| 101 | 102 | 100 |
| 111 | 110 | 105 |
| 119 | 120 | 112 |
| 116 | 117 | 114 |

We tried Sup them except all corrugated
but was poor, remark some mechanical reason
iron goes bad cold

These 75 + 35 Fahr Experiments
were only made to get good
Capacity cold. But it reveals
another thing & that is that
Corrugating seems to be BAD

Anhydrous Cobalt peroxide run at Fe
1 V 1/2

820 990
1030 1240

50th run

635 1/2
935 550
1035

Silver plating 7/2 pockets

Gold "

Copper "

Cobalt "

Cadmium "

Antimony "

Tin

Bismuth

BAD

BAD

No change

Improves

Improves

Considerably improves

No change

No change

⑦

5.0

Ferrous Ammonium sulphate makes
high efficiency ions (ignited) its
very light 3 grms to pocket.

| | | |
|------|------|-----------------|
| 1330 | 1985 | 449 MAH to Gram |
| 1365 | 1950 | |

Takes many runs to bring it up.
This is probably due to excessive thickness

Journal Chem Soc 1889

Following relates to passivity

| | |
|--------------|--------|
| Most passive | Nickel |
| Next | Iron |
| Next | Cobalt |

I remark that Cobalt plated
tubes after many hot runs were
very much covered than
plated tubes
But this refers to nickel & not to
Fe.

212 MAH To Gram

Pockets end loading

Wt 10.500

7 lbs Tamp weight. Cold test

75 Fahr

42 Fahr

1 V

1/2 V

1 V

1/2

2830

3990

2310

3520

2930

4115

2500

3435

2675

3735

2300

3395

50 Runs

100

250

500

550

1/2

3080

3100

2900

2690

2400

3325

3135

3150

2800

2005

2000

3040

3010

2900

2555

2260

2300

3450

10.800 grms

8 lbs weight on Tamp

75 Fahr

42 Fahr

1 Volt

1/2

1 Volt

1/2

2650

3700

1590

2775

2380

3400

1950

2350

2475

3535

1675

2450

181 MAH To Gram

50 Runs

100

250

500

550

1/2

2990

3100

2600

1900

1970

3125

2760

2760

2255

1520

1800

3160

2865

2785

2555

1925

2100

3050

Percent of loss $75^{\circ} + 42^{\circ}$

| | | 1 V | | | |
|-----|--------|------|-----|------|-------|
| 75° | 7 lbs | 2812 | 42° | 2377 | 84.5% |
| | 8 lbs | 2502 | 42° | 1838 | 73.4 |
| | 10 lbs | 2473 | 42° | 2193 | 88.6 |
| | 14 lbs | 2410 | 42° | 2230 | 92.5 |

More dense packing less loss of
Capacity from cath.

10 lbs wt on Tamp

10.832 Grms

| 75 Fahr $\frac{1}{2}$ | | 217 MAH Gram | 42 Fahr $\frac{1}{2}$ |
|-----------------------|------|--------------|-----------------------|
| 2540 | 3600 | | 2400 |
| 2500 | 3550 | | 1995 |
| 2380 | 3400 | | 2185 |
| | | | 3520 |
| | | | 1995 |
| | | | 3165 |

| 50 Runs | 100 | 250 | 500 | 550 | $\frac{1}{2}$ |
|---------|------|------|------|------|---------------|
| 3060 | 3120 | 2900 | 2465 | 2400 | 3630 |
| 2965 | 2850 | 2800 | 2100 | 2400 | 3375 |
| 2900 | 2860 | 2520 | 2150 | 2260 | 3265 |

11.500 Grms 14 lb wt

| 75 Fahr $\frac{1}{2}$ | | 197 MAH Gram | 1 V | 42 Fahr $\frac{1}{2}$ |
|-----------------------|------|--------------|------|-----------------------|
| 2300 | 3200 | | 2190 | 3180 |
| 2450 | 3475 | | 2305 | 3400 |
| 2480 | 3450 | | 2195 | 3180 |

| 50 Runs | 100 | 250 | 500 | 550 | $\frac{1}{2}$ |
|---------|------|------|------|------|---------------|
| 2815 | 2820 | 2800 | 2385 | 2300 | 3270 |
| 3075 | 2965 | 2800 | 2260 | 2400 | 3275 |
| 3075 | 2955 | 2575 | 2100 | 2080 | 3100 |

From this 7 lbs wt at end of 550 runs
gives same capacity as 14 lb wt.

7 lbs 8 10 14
217 MAH Gram 181 per Gram 217 197
Scarcely any difference to $\frac{1}{2}$ Volt.

Ignited 80 Fe 20 Copper 5% H₂O
 3.5g per pocket 410 MAH per Gram
 Dup gives 447 MAH per Gram.
 or 68% watt efficiency -

After Tabulating 20 Bismuth cells
 remark Irons go bad to a volt in
 Bismuth cells but OK to 1/2 volt
 Irons give good hot capacity which
 falls on cold running

Plating Fe pockets with Cobalt &
 probably good, plate thick

Bismuth Potassium Thiosulphate is a
 precipitate in KOH not in NaOH.

Mettanionate of Potash gives a white
 precipitate of Metanionate of Sodium
 Even diluted 1000.

All distilled water contains Ammonia

Potassium Stearate is soluble in 21% KOH
 but very slightly in KOH saturated with Lithia

Nickel strips 1/2 inch apart in small cell
 with 1 amp Cell having 90 cc
 following % of KOH

| | | |
|---------|---------|-----------------|
| 15% KOH | 2 hours | 10.3 Degrees F. |
| 17 | | 10.6 |
| 19 | | 11.5 |
| 21 | | 11.3 |
| 23 | | 12.5 |
| 25 | | 10.9 |
| 27 | | 10.6 |
| | | 11.57 |

With same %s of KOH, but with 2 gm LiOH
 in each cell

| | |
|-----|--------------|
| 15% | 11.0 degrees |
| 17 | 9.7 |
| 19 | 11.2 |
| 21 | 10.9 |
| 23 | 10.9 |
| 25 | 11.9 |
| 27 | 10.1 |
| | 10.81 |

Short charge - A cell 597 -
Charged normal dischgd 135°fah
gives higher capacity & $3/100$ higher
Volts than if charged and dischgd normal

If charged at 135°fah and dischgd normal
capacity is only 65% if charged normal
& voltage instead of 1.27 is down to 1.18

Long charge

Discharge voltage in this case is about
the same. But cells charged hot has
5% less capacity, than when charged
and dischgd normal, and charged &
discharged hot

The long charge acts entirely different
from the short charge.

WHY??

Rzq tubes Bi LiOH group.

Charged cold dischgd Hot
Capacity + Volts good 1280 ma.

Charged Hot, dischgd cold 500 ma

Charged Hot dischgd Hot 900 ma

Evidently charging not bad for Bi

Some Bi cells are fair when chgd +
dischgd Hot. 1200 on a 1350 mA Tube

- I say Fe is not affected like the
Nickel in charging Hot

Platin nickel in 21% KOH alone gives
1/3 of its capacity, on charging Hot
130 fair gives 1/2 capacity when
KOH has the 2 grms LiOH in it

With 21% KOH 2 LiOH. Biometh gives
3/4 of capacity

Matt Electrolyte
w/ LiOH

Regeneration of bad irons from a big cell,
using one Fe pocket with 4 Ni tubes in
small can. Tried 10 cells. I say that
the irons don't really go bad. Think it
goes passive from want of use.
The average of the 10 irons when we
started was 896
8th run 2289
15 " 2540
16 " after full charge and shorted
3 times was 3047

Evidently most irons can be brought
back to capacity by fully charging
and short circuiting, and repeating
this several times.

Iron in pockets gives different
capacities if pockets plated with
different metals. Continuum seems to
be the best. A tube with $\frac{1}{2}$ + flake
Ni was no good. It may be nickel acts
catalytically + kills iron.

3057 #69 Dr Grothe
3058

60% Fe
40% Cadmium
5% HgO } 5 grams

Charging Voltage only 1.65 V

Watt efficiency 61%

Amp 80%

1200 ma to Volt

Peculiarity is the low charging Voltage

90 Fe 10 Sb Split pkts busted 3063-4

95 Fe 5 Sb " " 3405-6

Both had 5% HgO -

3829-3830 80 Fe 20 Antimony 5% HgO

Selfheated gives 1420 $\frac{1}{2}$
1420 1350
1775

nearly 400 mA per Gram

lots of 80 Fe 20 Sb went all kinds of
ways 100 mA to 1400

WHY \rightarrow Dr Grothe
a fraud on
chemist

72 from ferrous sodium sulphate
gives highest efficiency yet.

5 grms

Long chg 1470
Short chg 1400

halogenated
lamp. 16 ft
these are sold

3143-4 93.4% Amp efficiency
Takes several runs to bring it up.

4584

4585

4586

} Bismuth in the iron.

Gets bad after 100 Runs

Cold - 150th

5% Bismuth 590 15

10% " 1175 25

15% 2140 15

Note = 5 Gram pockets 4587-8
Iron Oxide mixed with 10% metallic Aluminum
reduced to fine powder by hydrogen
containing no H₂O. run with 4 hi tubes

50th Run

1800

1710

1700

} to Volt.

4782-3-4 pockets not nickel plated
8.192 weightings

| | |
|--------|---------|
| 50 Run | 400 run |
| 2165 | 1700 |
| 2260 | 2035 |
| 2340 | 1850 |

Duplicate plated with Nickel

| | |
|--------|---------|
| 50 Run | 400 Run |
| 2500 | 2600 |
| 2260 | 2200 |
| 2500 | 2500 |

No 4779-80-1 8.192 wt.

This shows even Nickel is better
than no plating at all—

5 Gram cakes - Req. Fa.

50 Run IV

1/2

No H₂O.

1255
1535

1740
2200

2% H₂O

1540
1495

2165
2255

4%

1720
1630

2570
2400

6%

1790
1665

2605
2480

8%

1575
1553

2365
2255

10%

1740
1765

2590
2430

12%

1700
1795

2690
2710

14%

1800
1730

2640
2565

16%

1775
1525

2690
2360

Reg Fz 6% Hq 5 Gram Cakes 150 Run

All fines thru 20

| | |
|--------------|------|
| 1 Val't | 1/2 |
| 1570 | 2320 |
| 1640 | 2545 |
| <u>25320</u> | |
| 1800 | 2496 |
| 1800 | |

" 30

" 40

" 60

" 80

" 100

" 180

| | |
|---------------|------|
| 1845 | 2430 |
| 1450 | 2370 |
| <u>213295</u> | |
| 1575 | 2500 |
| 1765 | 2510 |
| <u>213240</u> | |
| 1775 | 2620 |
| 1675 | 2525 |
| <u>213450</u> | |
| 1890 | 2750 |
| 1755 | 2530 |
| <u>213645</u> | |
| 1465 | 2095 |
| 1255 | 1885 |
| <u>21350</u> | |
| 1375 | 3940 |
| 1990 | |

Regular Fz thru different sieves

30 on 40 average 1075

40 on 50 " 1380

50 on 60 " 1372

60 on 70 " 1572

70 on 80 " 1295

100 on 150 " 1890

Thru 180 - av 1705

| | |
|-------------|---------|
| 50 Run | |
| 950 | 2150 |
| 1200 | 1075 |
| <u>1400</u> | |
| 1360 | 2760 |
| <u>1400</u> | |
| 1345 | 2745 |
| <u>1345</u> | |
| 1530 | 2145 |
| 1615 | 1572 |
| <u>1250</u> | |
| 1310 | 2590 |
| <u>1860</u> | |
| 1900 | 150 Run |
| 1900 | 1640 |
| 1900 | 1560 |
| <u>1770</u> | |
| 1640 | 1450 |
| 1705 | 1530 |

Irons when run in cold temp, bad,
no matter how much the weight of
the temp is increased. $2\frac{1}{2}$ lbs
or 4.88 lbs.

Think solvent action of the Hg
causes Fe to get more dense &
shrinks away from contacts
Look like melted the dense iron
under micro.

Hypophosphite of soda don't
appear to hurt them -

Reg Fe mix 3 grms heated to 212 Feh
lost 3/10 of 1% - This sample exposed
to air saturated with moisture absorbed
as follows

| 15 Min | 6. Milgms |
|--------|-----------|
| 30 | 8 |
| 45 | 9 |
| 75 | 11 |
| 105 | 14 |
| 135 | 14 |
| 225 | 14 |
| 315 | 17 |

It appears that we cannot use
Iron as a negative if 100mV is to
be used in 1st tube, perhaps Cadmium
or Cobalt may do, -

It's probable that in big cell the
Fe loses capacity as salt as it increases
& we get no gain like we do in little
cell with great excess of Fe.

Doubtful



Shows how Bad our little
tube test is —

Long Tube

| | 25% Kott. 2 | 1/2 cold | 25 | 50 | 100 | 200 | 1/2 |
|----------|-------------|----------|------|------|------|------|-----|
| Run Cold | 1690 | 1772 | 1774 | 1774 | 1655 | 1787 | |
| " Hot | 1700 | 1509 | 1701 | 1474 | 1401 | 1446 | |

This belongs to Model Book

Cold
Hot

200 Run

1561

1247

3 Lott 25 Kott

Cold
Hot

1653

1590

33 Kott 1 Lott

Cold
Hot

1595

1239

33% Kott 2 Lott

Cold
Hot

1532

1340

21 Kott 50 Wly Lott

Cold
Hot

1729

1274

21 K 100 Wly Lott

Cold 1764 } 21K 200 milly h. 100H.
Hot 1440 }

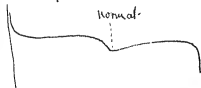
CoD 1728 } 21K 400 milly h. 100H.
Hot. 1436 }

Cold 1797 } 21K 700 milly h. 100H.
Hot 1382 }

Copper mixed with iron leaches out on hot test
and iron nearly loses all its capacity
When reversed if it is not reversed it loses
very little capacity

At 5 gram Fe gave 1480 Chg. dischrg
Normal is 15 hours 400 dischrg 300

Same iron chgd. & dischrgd 110° Fahr
gave 2550 to V iron has a dip
where its falls off normal



Reg Test Fe taken out of test cells
after going Bad & after 250 Runs
Went bad from lack of use, from
Cells 1630 1639
Average of ten They are reg Storage B Irons

| Run | V | 1/2 | |
|-----|------|------|----------------------------|
| 8K | 896 | 3516 | before coming out of cells |
| 15 | 2289 | 3796 | |
| 16 | 2540 | 4658 | |
| 17 | 3047 | 4709 | |
| 18 | 3137 | 4431 | |



Notebook Series -- Notebooks by Edison
Notebook, N-14-01-01.1

This notebook was used by Edison, probably during the period January-August 1914, and was annotated by him on several subsequent occasions, including January 1, 1916. It consists primarily of notes from the numbered battery record books (*Thomas A. Edison Papers: A Selective Microfilm Edition, Part IV*, Notebooks by Edison and Other Experimenters—Battery Record Books) and other earlier notebooks pertaining to alkaline storage batteries. Included are data and observations regarding the capacity and efficiency of numbered experimental cells. Many of the entries relate to the composition, construction, and treatment of positive electrode "tubes" made with nickel and other metallic flake (including cobalt and bismuth flake) or treated with other metallic additives. Other entries pertain to negative electrode "pockets" made with different preparations of iron, to the use of different electrolyte solutions, and to the possible rejuvenation or "regeneration" of used battery components. Inserted into the book are several loose pages of notes, including a 1910 memorandum from Walter E. Holland to Edison regarding the construction of three experimental cells. The front cover is labeled "Very Important." The pages are unnumbered. Approximately 130 pages have been used.

Arsenate of Hg is not in K₂S

I think Arsenic metal is reduced to metallic if so is there local action, or what -

Send Formate K formed in our cell in presence of CO₂

Hunt. Know - all cyanide compounds hunt iron.
Why - Formate decomposed by KOH.
is & Shuttle. O₂ & Red

Notes

Old Green - 1907

Iodides in electrolyte very bad for Nickel
reduces capacity more than half.

Arsenic Acid is bad for Cell. Arsenate of Arsenite, diminishes Capacity 20 @ 25%
100th run in small test cell -

Formate K is bad, reduces capacity 20 @ 25%
100 Runs.

Tried
2 gm KBr } 100th Run 25% lower than regular
2 " KCl
2 " NaCl
2 " NaBr

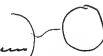
4 Na Sulfide 100 Run OK
2 Na Sulfide 2 KCl 100 OK



4 gram KCl 50th run 40% lower capacity
2 ferrocyanide K ..

5 gram K Benzoate OK 100

5 " K Bifluoride K 100 Run



Saponin

- 5 grms K Binoxalate OK 100 Run
- 5 " K Bisulfite OK "
- 5 " Borax - 6% better "
- 5 " K Bromate OK "
- 5 " K Hypophosphite 20% " Lower
- 5 " Diphosphate OK "
- 5 " Lactate K OK "
- 5 " K Nitrate OK "
- 5 " K Nitrite OK "
- 5 " K Orthophosphate OK "

5" Realgar wouldnt run at all, had to empty and put in fresh Rott 21% show 45% loss of Capacity. Iron was badly injured Nickel not at all.

5 grms Ethylenephosphor K - OK - 50# run, it foamed terribly -

- 5 grms K Acofluoride OK 50 Run
- 5 " Formaldehyde OK 50 "

Cobalt Peroxide made by Bromine 5.27 grms only gave 18% of Capacity that Nickel does

Iodide Hg Cyanide Hg soln OK

Succinate Hg Sal KOH
acts like sulphur

| | | | |
|-------|----------------------|-------------------------------|---------|
| 5 gms | K Cinnamate | OK | 50 runs |
| 5 " | K Cyanate | Iron badly hurt | |
| 5 " | K Yodate | Nickel badly hurt. | |
| 5 " | K Nitrobenzoate | Iron badly hurt. Nickel OK | |
| 5 " | Asclanide | 20% loss | |
| 5 " | Flour Sulphur | 40% loss, too great an excess | |
| 5 " | K Selenate | 10% loss | 50 Run |
| 5 " | Milastanide K | OK | " |
| 5 " | Sulfosuccinate K | OK | " |
| 5 " | K Succinate | OK | " |
| 5 " | K Tetrurate | 20% loss | " |
| 5 " | Hard rubber shavings | OK | " |
| 5 " | Magnesium powder | OK | 100 |
| 5 " | Cadmium " | OK | 50 |
| 5 " | Lead " | OK | 50 |
| 2 " | Paper | OK | 100 |
| 2 " | Na Sulphite | OK | 150 |
| 4 " | " | OK | 150 |
| 2 " | Na Sulphate | OK | 150 |

(Experiments when we were using mostly Cobalt
flake shows that when Ni flake was used
it was 10 to 15% lower capacity.)

(Damp Ni(OH)_2 makes heavy loading weight)

Selenium acts like sulphur

No question of conductivity comes in
higher capacity due to more ions in
pores to do the work.

500 Milg Sulphide Arsenum 25% loss capacity
" " Selenium 60% loss " 100

With tubes we use now

| 2 grms. OH | 27% KOH | | 50 th run |
|------------|---------|--------|----------------------|
| " | 25 | " + 44 | 1360 |
| " | 23 | " + 41 | 1316 |
| " | 21 | " + 34 | 1275 |
| " | 19 | " + 9 | 1221 |
| " | 17 | " + 14 | 1212 |
| " | 15 | " + 23 | 1183 |
| " | 13 | " + 32 | 1139 |
| " | 11 | " + 20 | 1161 |
| " | 9 | " + 20 | 1129 |
| | | | 1109 |

1907

1907 says this shows charging hat
is bad, and Cobalt plate is much worse
than Ni plate,

Iron is not active at low temp;
requires like Carbon a certain heat
when in a certain physical state to
make it react rapidly. Only way
out is to get more porous & finely
divided iron + keep down temp or abandon
it + increase disch. rate for heavy work
by increased surface -

A 5 gram Iron pocket giving 1480 to a volt
Charged + dischd Normal, 15 hours 400 Dischd 300
Same $\frac{1}{2}$ charged + dischd hot 110 Fahr
gave 2550 to a Volt, Why?

We never gave Calcium or Rubidium hydrate
a good test.

(Ni tubes never plated always went bad
on hot test, - see further on cleaning this)

Ni tubes run in saturated LiOH , get a
very red coating on tube can't be rubbed
off. Ogma Rega takes it off in quick in
transparent sheets having a reddish tint
After 50 runs more + grids bright altogether
different from Reg tubes. This is on
discharge, but after 100 runs a brown
red strongly adherent to tube. This
is 6059. Electrolyte being 21% KOH
saturated with LiOH .

6059 is put in test tube with 100 cc water
+ 100 mg HCl for several hours over asbestos

possibly gelatinous ferrous carbon

O

Why?

~~NaBr of ferrous
sulfate in electrolyte~~

Hydroxide the Fe + badly plate Irons

Reg cells, 5 times normal boost to minutes
don't hurt in normal electrolyte but
hurts bad when weak. Why
Extra heat possibly

on hot plate, in few minutes clinging
red wipes off, don't think it dissolves
but HCl dissolved off something that made
it loose

Aluminum is bad in KOH NaOH,
Worst of all,

3 grams of ferrous hydroxide put into
Electrolyte 21 KOH 2 L. OH 150 Runs
actually increased the Capacity a little,

→ Acetone is bad

NaBr seems to help Irons
300 Mils Potassium in Electrolyte 21 KOH
seems to increase capacity of the Irons
Can it correct passivity?

Nitrates are bad either for Iron or Ni

Carbonates don't hurt I even seems
to help - when KOH, but hurts in NaOH
when it Na Carbonate, 15% NaOH 2 L.

Must expand greatly in length.

We should Precip Ni by LiOH - see
if Li is washed free or is there a combination

Perhaps the gas which comes off on
putting in acid is air in the pores

2% water

may want
2.9 g NiOH

A saturated solution of LiOH in
water, causes tubes to be twisted.
Cook screw like and bent.
 Ni(OH)_2 must be an acid & Li forms a salt
with it hence enormous swelling!
June 1907

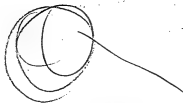
Ni(OH)_2 absorbs water from the air
There is always some NaOH left in it
also Carbonated -

Took 10 grams green from drum
thru 20 tubes in - put on watch
glass in two hours on hot plate
on a piece of paper lost 85 milg
in air and regained 191 milg

Ni takes thru hydrogen is no good
must be elastic & not dead to make
contact with walls of tubes -

5 grams lithium chloride 21 KOH better
than 21 K 2LiOH.

Bismuth is not good except with LiOH .
only gives mg +



This seems to show porosity is not
Enough in Ni don't get enough ions
to give capacity

Phosphates Lithia is insol in KOH.

Evidently Li displaces Ba in the electrolyte

Another Case where Phosphoric
Compounds are bad

There are Cases where
Phosphorus does no harm

Phos does
not combine
with Ni & V & Fe from KOH

Green soaked in Titanium Sol 21K OK
" Zirconium " " OK
" Nitric Didymium " OK
when d. off put in it reduced capacity
Green soaked with Bichl. increased " slightly
another place further on says Bad,

Pure Ni Tubes. Ni rings Ni wire -
100 Runs $\left. \begin{matrix} 1160 \\ 1140 \\ 1147 \end{matrix} \right\} 21\% \left. \begin{matrix} 1263 \\ 1263 \\ 1268 \end{matrix} \right\} 21 \text{ 2 L.O.H.}$

$\left. \begin{matrix} 1360 \\ 1353 \\ 1353 \end{matrix} \right\} 25 \text{ 2 L.O.H.} \left. \begin{matrix} 1433 \\ 1433 \\ 1433 \end{matrix} \right\} 27 \text{ 3 L.O.H.}$

End Book No 4

Book 5 Soaked Green in Orthophos
Palash then in Chl Ba - without
d. off gave 987 with L.O.H. 2 470 -

Soaked KSO₄ then Sr Cl₂ gave 1219 + with
2 L.O.H. 1240 -

Antimoniate K₂ BaCl₂ 843 - with L.O.H. 1042
Cone Stannous Soda + BaCl₂ 1214 with L.O.H. 1258

Nickel May be a compound
Also here is a method of separating
the two, or something in Ni(OH)_2
that combines with LiOH .

It is remarked here that acid treatment of flake
removes Al_2O_3 & Fe_2 .

Reg M along here with 2 LiOH. was giving
1330 after 25 hat runs

End Book 5

8000 group

Book 6 = # 7450 group

St. Carbonate

500 p.p.s in pores 800 Run 1133 - with LiOH 150 Run 965

Ba Carbonate " 300 Run 1080 " 150 Run 1038

Boiling green in Conc H_2SO_4 + washing out free
show large loss capacity after 150 Run
especially when LiOH is used -

without LiOH lost 70 W at 150 run

with LiOH lost 250 - another Run -

without LiOH, lost 159 - with LiOH, 267 -

This is strange -

Alcohol saturated with H_2SO_4 + then
washed free much poorer capacity, when
LiOH used -

Soaked green in Conc Ni(OH)_2 in ammonia
+ NH_4Cl . boiled with KOH, washed well.

150 Run no loss capacity. it was cut out 1150 -

No def when strontia used

KOH decomposes Chromium
Known to make Irons go bad

Possibly closed pores so not
enough ions to react,

Another Case where phos combine
to dead the Li film in KOH.
We shall have to test Fe & wires
for phosphate -

^{2-3 weeks after 11/1/50}
Bismuth - 10 min soak 1/2 strength Conc BaCl₂ H₂O₂
left all night 10% KOH. Then boiled & washed free Cl,
6#1 wt.
Cotd

| | | |
|------|------|------|
| 50 | 150 | 200 |
| 1033 | 1120 | 1120 |
| 1155 | 1450 | 1239 |

 1176 - 1000 1290 - LiOH in this

Another with B₂ made nearly same
went to 1367 on 100 & then bad -
Another where tubes soaked went from 1130
to 1380 on 100 & then went bad - 990 -

(Green soaked BaCl₂ K₂SO₄ - No LiOH, better
than with diOH -

Soaked BaCl₂ + Chromate K₂ - Irons
go bad -

Soaked Green in K₂Mo + BaCl₂, only gave
580 @ 640 - Cal - bad -

Orthophos R + BaCl₂ - No Li, so Run 990
but with diOH, 467 - Note bad affect
of phosph on diOH. ^{11/26/50}

We were Oxidizing flakes at this
time -

Evidently Li don't combine or displace CO_2 from lime,

not oxidized now —

Another Case carbonates in green effloresced the LiOH and went to bed

8791 group RA 1072 at end 200 Runs
200 higher than the Dup in LiOH —

When mg CO_2 atoms are present in parts of green the LiOH dups are much worse than Reg 21 KOH, with phos lime capacity about same KJ = Carl same capacity

Green soaked in Conc B_2O_3 in Acetone
 LiOH - which seems necessary for B_2O_3

| Cal | 25 | 50 | 100 | 150 | 200 |
|------|------|------|------|------|------|
| 1062 | 1380 | 1394 | 1360 | 1347 | 1280 |

13 months of
Little Mercury precipitated in the pores
No LiOH . 150 Run 1106 — with LiOH , 1335.
350th Run 1237 } 400. 977 } put in new Fe
1270 }
1287. } 500th Run 1219 }
1247 } — ←

where Bi
in the

of same mass on book

5 gm vials - Diff % Hg Highest
50 Hot Runs

| 2% Hg | 750 rate | 300 Rate |
|-------|----------|----------|
| | 425 | 1545 |
| 3% | 1037 | 1720 |
| 4% | 962 | 1645 |
| 5% | 850 | 1610 |
| 6% | 987 | 1630 |
| 7% | 837 | 1600 |
| 8% | 900 | 1560 |
| 9% | 962 | 1600 |
| 10% | 950 | 1560 |



Low % Hg

See book marked for consultation -

| 250th | 750 rate | 300 rate |
|-------|----------|----------|
| 2 | 125 | 790 |
| 3 | 175 | 1100 |
| 4 | 280 | 1065 |
| 5 | 212 | 1100 |
| 6 | 612 | 1070 |
| 7 | 412 | 1005 |
| 8 | 406 | 1005 |
| 9 | 542 | 912 |
| 10 | 375 | |
| | 480 | |

Ni flake treated with BiCl₃ NH₄Cl reduced
Bi on flake steel Colbi washed with
Ammonia Chloride

| Gold | 100 | 200 | 250 | 300 | 500 |
|------|------|------|------|------|------|
| 1220 | 1420 | 1480 | 1426 | 1520 | 1275 |

650 cheap 72 and no good -

Tried almost every organic in the Rott,
Cresol Bad Very Benzidine -
Trichlorophenol Bad
Salicylic acid Bad
Picric acid Bad
Resorcin Bad
Methyl salicylic acid
Formaldehyde Bad

Hg salts of
these sol
in Rott 2 hr

| #571 - 168 Bi - | 50 | 100 | 300 | 400 | 550 |
|-----------------|------|------|------|------|------|
| | 1430 | 1440 | 1450 | 1240 | 1240 |
| 6000 + 1000 | 650 | 700 | | | |
| 1490 | 1570 | 1557 | | | |

Noted that after a long time
without Lott. if vials are changed
it goes bad whereas if Bi is
present & I remark that need for
gives out something that hints like

Li Off Bi flake

Phosphotungstic Acid -

Electrolyte gives high hot run
1365 to V 1510 1/2 volt + 1153 Hot

NOTE

Phosphomolybdate K High hot

2 + 4 grms - but only
gives 387 to Volt Calcd + 1003 hot

2 phos molybdate, no Li Off
367 to V, Run 387 Hot.

Antimony K. 650 } 1 volt 500 Run
+ 1190 to V Hot 597 2 L. 650.

Preferable -

Smaller Drop #1654 2 grms

Phosphotungstic K-1375 to V #1122 by Hot
2 L.

Note this, It was Antimony in its
that gave such abnormal high
Capacity but very capricious
It's a warning for K & I think

In 2 cases with ^{Reg} ^{Bi} tubes running
550 times hot 1/2 V was 1640 + 1 V. 1230
but when ^{Reg} changed 1 V was 1440 +
1/2 V 1550.

Note that low LiOH is best for
Bismuth for a long run #1172
But mark it Doubtful, Kopper Made
Mistake -

Acetanilide Very bad 50 runs
Picric acid "
Dinitrochlor " "
Triacetylhydroquinone Bad " ^{Phosphomolybdate}

Phosphomolybdate K 50 Run Zero

#1948 to here Cook 10

Get the Fe books

Make Notes -

Especially Analytical
Iron

In Book 13 notice good effect of
changing iron.

| | | |
|-----------------------|-----------------|-----------|
| 200th Run | changed iron on | 250th Run |
| 1270 | | 1413 |
| 1283 | | 1540 |
| 1263 | | 1473 |
| on 20th 400th Run was | | 1293 |
| | | 1267 |
| | | 1300- |

This shows or appears to show we
don't have enough iron

With 36 mly gross to 4.2 flake

| | | | |
|-----------|------|------------|---------|
| 200th Run | 1330 | changed Fe | 250 Run |
| | 1223 | | 1437 |
| | 1330 | | 1433 |
| | | | 1433 |

| | |
|------------------------------------|---------|
| With 48 gross to 4.5 flake to dump | |
| 200th Run - changed Fe | 250 Run |
| 1390 | 1462 |
| 1320 | 1400 |
| 1420 | 1477 |

(But there were 3 cases where
changing iron didn't do any good
on same pages -

do not build up after original
hydrogen made iron is oxidized

Don't chlorinate
or Al or Y anodes
I wish to see
these done

#579 168% Bi Run first 21 K 2 L
at 00th then 21 K 2 L

| | | | | | | |
|------|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 | 350 |
| 1496 | 1490 | 1446 | 1305 | 1497 | 1492 | 1337 |
| 400 | 440 | 500 | 550 | 600 | 650 | 700 |
| 1365 | 1493 | 1506 | 1356 | 1493 | 1525 | 1556 |

Another change & changed wire in
21 K 2 L at 1/4 the then changed to 21 K 2 L
at 700th Run gave 1536

I note Run - Changing Iron improves
Bismuth tubes on 1st, 2nd & 3rd runs
that run capacity which falls 33%
on 1st change comes back - This is
not as with Non Bismuth - they improve
on 1st run & then they grow bad as if
iron gave out something bad.

A Sealed Bi given gave 1314 50th run
then run along given
100 150 200 250 300 350
1250 1350 1450 1530 1250 1010 7
changed 2 1170 1335

Guess loading wt change
 or its liable burst tube from
 water lubricating & making
 dense & too much load
 wt -

Green mixed with Oxide Brown with 10%

| Cold | 50 | 100 | 150 | 250 |
|------|------|------|------|------|
| 1093 | 1450 | 1440 | 1533 | 1587 |
| 350 | 450 | | | |
| 1615 | 1550 | | | |

remained 1164 too heavy

Book 14

Exposing green for 2 weeks
 did no harm -

~~but do to bottom~~

Connected 2 gram Tin
 to each tube -

dillo 2 gram B & 2 Tin

dillo " Pb & 2 B.

dillo " Arsenic only

Did neither good or bad

(Charles)

Tube filled within 1/2 of each
 end, the end filled Carb Soda
 went bad only 967 milamp
 brown - flakes & green got
 chance to expand & get out
 Contact -

(Dried Alumina seems to do not harm but undried precipitated Aluminum precipitated in Electrolyte is very Bad -

This seems true for Silica

Drying changes both makes them inert, non colloids

Probably true of $\frac{1}{2}$ Ar & Ti
it's only when not dried they are bad,

Because dried

Q Silica precep in green $2\frac{1}{10}\%$ did no harm even 1% no harm
Neither did 1% Aluminum but when it dissolved out, or dried

Q $1\frac{1}{2}\%$ Co precep in green showed improvement,
 1% decided improvement, 350 m
1410 -
2 grams Silica consumed
Each tube went bad only 780

B. & S. ditto

Cr 2 gms went a little bad

Vanadium is Bad for cells

Neither $\frac{1}{2}$ or Ar same
precep in green in small
quantity is bad - or Ti

1164 grain is heavy grain -

Mixed 20% Anthracite B. with it

| | | | | |
|------|------|------|------|----------|
| Cold | 50 | 100 | 150 | 250 |
| 1260 | 1530 | 1720 | 1747 | 1555 Co. |

Burnt 3 places -

30% B. once only didn't do as well

50% " " Much worse

Another 20% B. O. only 500 Run

it showed with a 30% B. O. only
1887 to $\frac{1}{2}$ Valt after 200th Run
but only 1267 to .9 - 72 Good ?
grains

Effect of dissolving Metallic Aluminum

| | |
|---------|---------|
| Milgm - | 100 Run |
| 3 | 1230 |
| 4 | 1230 |
| 5 | 1232 |
| 27 | 1125 |
| 81 | 1062 |

20 May - 1900
21 May 21 -
approx OK

This apparently Bi₂O₃ does not conduct
as Ni(OH)₂ alone without flakes.
gives 200 mat -
What does it do.

find out

Green mixed with 16.8% Bi₂O₃ put in tube
Without flakes 500th Run 103 Mat

2 gram Tellurium Connected
etch tube, not good -

ditto 72 Va alloy - Jerry bad 610

734 gram 16.8 Bi₂O₃ - 142 ch₂der
in 8% KOH, 1/4 rate, then changed
to 21K2Li -

| 500 Run | 800 run | 1050 run |
|---------|---------|----------|
| 1487 | 1524 | 1577 |

| | | |
|------|------|------------|
| 1250 | 1300 | (Bad bent) |
| 1423 | 1333 | |

Another one changed & dis
hovee in 4% 1/4 rate then
put in 21K2Li quora
about the same

$$\begin{array}{r} 5.145 \overline{) 7600 - 1477} \\ \underline{5145} \\ 2455 \\ \underline{2058} \\ 3970 \\ \underline{3675} \\ 395 \end{array}$$

1477

$$5641 \overline{) 7600} \begin{array}{l} 1347 \\ \underline{5641} \\ 1959 \\ \underline{1672} \\ 2867 \\ \underline{2256} \\ 611 \end{array}$$

$$1073 \overline{) 5521} \begin{array}{l} 5145 \\ \underline{5365} \\ 1565 \\ \underline{1073} \\ 4920 \\ \underline{4814} \\ 106 \end{array}$$

$$1123 \overline{) 6333} \begin{array}{l} 5641 \\ \underline{5615} \\ 18 \\ \underline{1123} \\ 671 \end{array}$$

$$1095 \overline{) 6445} \begin{array}{l} 539 \\ \underline{5975} \\ 470 \\ \underline{470} \\ 0 \end{array}$$

$$109 \overline{) 5912} \begin{array}{l} 5357 \\ \underline{5853} \\ 59 \\ \underline{59} \\ 0 \end{array}$$

$$107 \overline{) 6399} \begin{array}{l} 551 \\ \underline{5885} \\ 514 \\ \underline{514} \\ 0 \end{array}$$

Goote Run Highest tube only

| 2 lb weight lamp | 5.145 mg L.M.H. 1477 | 1073 | Weight 11.11 |
|------------------|----------------------|------------|--------------|
| 2 1/2 | 5.351 | 1103 | 5902 |
| 3 | | 1050 | 6027 |
| 4 | 1077 | 5.641 1123 | 6333 |
| 4 1/2 | | 5.510 1157 | 6399 |
| 5 | | 5.390 1193 | 6445 |

2 lb weight lamp
Capacity for green
Marble

End back 15

flung down burrs
rolling in it

lime carb mixed in green
in powdered form does not
burn - used powdered
Marble

It certainly is curious, we have
much to learn about the iron

Possibly Ni plating is not good
see 3 pages ahead where non
plated iron gives good results.

Perhaps Mn has come
had action on the
try non plated tube
without flake -
going with brilliant Hg
(Catalytic)

Celluloid dissolves in KOH.

Iron pect in tubes 10 gms
only gave 2100 mAh no
flake -

with flake went to 250
mAh on 200th run celluloid
with and flake 1230 -

This is Curious

B1 don't work without H₂O₂
100th Run

No H₂ - 933

1% H₂ 1380

2% 1533

Took piece film Celluloid
filled it in tube & loaded it

Didn't do any harm ⁵ 970 flah
1200 on 290th Run

This goes to show that B_1 dissolves in KOH
 & is reduced by the iron, or lowers its
 voltage as it can't reduce the nickel
 but when heated its voltage is increased
 or the B_1 is oxidized & no longer interferes

Tantalum is now known to act as
 a valve like Al in rectifier &
 more strongly -

B_1 in $NaOH$ & various LiOH not
 near as good as KOH ,

5 gram Coke Reg Fe without
 H₂ - But with
 5% B_1 in Fe Cold 100 Run/44
 590 45 1510
 10 % 1175 85 1260
 15 % 2130 85 1260

Note →

Tantalum Bed -
 1 gm wire connected to L₁ & L₂

2 gm Alum Neutral Connected
 to L₁ & L₂ 1093 - 50 Run
 no capacity at all

This must effect the iron
 No₃ body $\frac{1}{2}$ then forms an
 inactive hydrate probably S

It may be that Ni acts catalytically
 in K₂ and has both for Ni tubes
 + 2 iron tubes - from trying 2 cells
 are in placing in tubes pockets or
 grids - only the plain plates.

Have not received
 nickel gas 600
 from Hermann OK

It may form iodate film
 or combination with Ni (OR)

Dehmerka fund
 what taken
 Hrs soluble Si Cur act

20% B₁ tubes -

2 grams K Nitrate in Cell
 Very Bad 587 on 50th Run best
 gave 1623 to $\frac{1}{2}$ vact,

2 grams Na Nitrate only 400 to g -
 + 1683 to $\frac{1}{2}$ vact,
 otherwise Na hunt comes

Req Ni Req tubes Not placed
 gives 1258 300 Run 1190 500 Run
 600 run 1073 - see note back

2 grams Iodide K -
 B₁ tube - gives no
 ely or discharge

B₁ tube 2 grams Na Silicate
 50th 1355 - 100th only 120
 130 to $\frac{1}{2}$ v 1250 net,

7613/5040 (2)

$$\begin{array}{r} 1850 \\ 13 \overline{) 24000} \\ \underline{13000} \\ 11000 \\ 22 \overline{) 11000} \\ \underline{2200} \\ 8800 \end{array}$$

$$\begin{array}{r} 1770 \\ 13 \overline{) 24000} \\ \underline{13000} \\ 11000 \\ 22 \overline{) 11000} \\ \underline{2200} \\ 8800 \end{array}$$

should have been run
longer on brass

Sulphate lime in case no harm

25% Cobalt precip in green

| Cold | 50 | 100 | 150 | 200 |
|------|------|------|------|------|
| 927 | 1370 | 1507 | 1467 | 1460 |

300 450
1360 1310 - burnt 1 place wt 7613

30% Co 150 Run Cut out
1393-

50% Co 1290 - Cut out

Another 30% Co - 300 Run 1367
Note says of this had been
run on brass several
times would have been
very high -

25% Cobalt

| Cold | 50 | 150 | 300 |
|------|------|------|------|
| 1083 | 1490 | 1400 | 1357 |

500
1193 -

Arsenic probably reduced
to metal

This not run as long as 4 yr old
Is below - but takes yr glow
1050 kv in many cases

Proves N_2O_4 don't go bad
its colloids destroying Contacts

Later Aug 1 1914 Cut open $1/2 \times 1/2$
old tubes. 4 yrs that gone
down bad - tried flake
Contacts in test machine
found that 85% of flake
sections were in contact
Evidently N_2 itself gone bad, Colloids
or dehydration, or combination with
some acid

Arsenic bad in T31 tubes - (12)
Arsenical Na in Glass C. S. 110

Mix taken from abs 927 & 928
Lifter - tubes washed free of K₂SO₄
dried 80° 835° - taken out all of Lifter
except perhaps 15% removed
Next treated with weak H_2SO_4 -
then washed & dried.

Book 16 - 4443 -

| | | | | |
|------|------|------|------|------|
| Cold | 50 | 100 | 150 | 200 |
| 1380 | 1293 | 1282 | 1327 | 1283 |
| 250 | 300 | 400 | 500 | |
| 1385 | 1417 | 1393 | 1350 | |
| 550 | 600 | 750 | | |
| 1327 | 1153 | 1073 | | |

Perhaps for worst bad
or might have run longer

I had a Chemist (sic?) test for H_2O_2
but he couldn't find any —

Hydrofluosilicic acid precipitates
Palaeum as palaeum silicofluoride
Insol. — Potassium acid
precip. K

Acid Melantimonate of Palaeum
gives white precip of Sulium
Melantimonate
L. NH₄. + little metal does
same thing —

There is no doubt but that
when H is given off from on
change, that if the N + Fe plate
are too close we get H_2O_2
then we would reach a
limit to the change of the iron
perhaps thick pockets, by
poor circulation present or most
if the Fe from reoxidizing by
 H_2O_2 formed — it would
be interesting to put paper
between plates to stop
oxygen going into Fe Pocket

Test electrolyte of chgs
Cell for H_2O_2

To make $Ni(OH)_2$ more porous
precipitate $NiSO_4$ } by $NaOH$
Manganese SO_4

then wash & dry put in tubes
put plates in 21% KOH or NaOH
+ Oxidize to Manganic + wash
out as when using K

ditto $NiSO_4 - CrSO_4$
" $PbSO_4 - Stannous -$

Potassium Bismutate
Insol water - sol very
dilute acids - This is
what possibly makes
 Ni go bad

Potassium Hippurate insol cold
sol hot water,

Potassium Iodo-purpate V slightly
sol water - Explodes dangerously
at $210^\circ C$ - H_2SO_4 explodes if
its K P. cro-cyanate.

Potassium Nitramate only sol
hot water - Explodes violently
on heating

K Perbromate only slightly
sol water

Ditto K Perchlorate slightly
sol water

K-periodate, v slightly
Sol water

K Perruthenate slightly
Sol water

K Permanganate slightly
Sol water

K Phosphate only sol
Hot water

K Phthalimide only
Slightly Sol water

K Piperate, only sol hot water

K Pyrosulphite only slightly
Sol water

K Silicofluoride - only sol
in hot water

K Seleno-iodolates (K Diiodopara-iodo
sulphonate) slightly Sol water

K Urate, v slightly Sol water

Lithium Borate, v slightly Sol H_2O
" Fluoride
" phosphates Insol water

Think Fe_2O_3 from fuming sulphuric
acid will give a good capacity
at lower temps than Fe_2O_3 now.
~~Walter~~ Made its very fine -
& possibly it will be best
without mercury as that
tends to crystallize & make it
coarser - 1 lb. Wecker & Smith
test Reg. view without Ag
for effect of cold.

Cells with weak KOH
can be reduced by passing
sulphurous acid - goes
rapidly - produces K_2SO_4
Try old cell three & wash
out K_2SO_4 -

Old view from 4 yr cells if washed
with 3% Sulphurous acid -
& ground thru 150 mesh is
nearly as good as new. Apparently
acts as reducing agent.

Stranger thing is that view looks
black when taken out of SO_2
acid if washed & dried is
as dark red all thru & yet
runs good -

Strange!

Charge cold Ni + $\frac{1}{2}$ OK
 Hot Ni + $\frac{1}{2}$ Bad
 Dischg Cold Ni OK $\frac{1}{2}$ Bad
 Hot Ni OK $\frac{1}{2}$ OK

The great problem is to equalize these two opposite effects because in the Cell one works against the other

We know that Bi in NiOH₂ causes it to give $2\frac{1}{2}$ times Reg dose on hot discharge. Does oxidation of Bi give local heat enough to cause NiOH₂ to be easily Oxidized while Electrolyte is cold. Cobalt would also, this may be the explanation

Nickel tube on charging hot + dischg hot gives only $\frac{1}{3}$ the Reg temperature Charge + dischg Capacity, 400 @ 500 when gives 1350 chgd + dischg Normal temp - its not the iron as that gives high capacity on hot discharges.

Find from Smith about Capacity chgd hot dischg Cold " Cold " Hot for Ni + $\frac{1}{2}$ Want these Curves =

We found that iron gives greatest Capacity Reduced Cold Oxidized but Nickel, Oxidized ^{fully} reduced ^{Hot} is the above OK acc Smith

Nickel tube chgd Cold holds its Chg in hot 130 + gives full reg Capacity. Therefore when Ni(OH)₂ is formed its stable but when Electrolyte hot its hard to Oxidize -

Is this Correct

Possibly both iron & ni should be
both on chg Cell be in cold
electrolyte. But on discharge
its certain iron should have
heat as its dead at 40 degs

But the Ni is also affected &
Smith must find if its
By hot or cold that cause
loss Capacity -

Its probable Ni wants to be
chg + dischg Cold
While Fe wants just the opposite

Aug 1 1914 - Iron in new cell #4 has
only crimped around edge, given
2700 Balgular - gives 1900 at 35°
deg -

Jan 1st 1916

Made a lot of tests but
in the end they were
no improvement.

Jan 1 1914

Important to work on
getting Iron finer in cells.

This will increase work
efficiency - & also
act at lower temperature.

Have I still make a
larger batch of Iron ox
from fused $\text{Na}_2\text{SO}_4 + \text{NaOH}$,
in which any iron
FeSO₄ is dropped using
slight excess NaOH,
This is practically colloidal.
See if product will
work without being
reduced by the oxygen
if not reduce at lowest
possible temp by the ~

9/10 of Volt —

| | Cold | 50 | 1/2 | Hot | 100 | 1/2 | Hot | 150 | 1/2 |
|------|------|------|------|-----|------|------|-----|------|------|
| 2294 | 1210 | 1380 | 1417 | 387 | 1447 | 1497 | 507 | 1480 | 1570 |
| 2295 | 1200 | 1388 | 1423 | 377 | 1440 | 1493 | 473 | 1463 | 1533 |
| 2296 | 1210 | 1390 | 1427 | 353 | 1461 | 1520 | 520 | 1510 | 1573 |
| 2297 | 1213 | 1417 | 1440 | 327 | 1460 | 1500 | 477 | 1460 | 1490 |
| 2298 | 1220 | 1440 | 1460 | 387 | 1530 | 1587 | 547 | 1520 | 1553 |
| 2299 | 1213 | 1417 | 1443 | 347 | 1463 | 1507 | 508 | 1493 | 1523 |
| | | 1424 | 1435 | 351 | 1468 | 1514 | 521 | 1488 | 1530 |

| Hot | 200 | 1/2 | Hot |
|-----|------|------|-----|
| 863 | 1367 | 1483 | 690 |
| 797 | 1383 | 1463 | 640 |
| 913 | 1413 | 1550 | 694 |
| 667 | 1363 | 1477 | 600 |
| 657 | 1420 | 1497 | 580 |
| 673 | 1407 | 1457 | 580 |
| 744 | | | |

CO =

1164 RA green loads mag way
 8.2 - This is pro 1253 RA adump of 1164
 These hits load 7.650 - 7038 green
 #159 flake 4 flake 47.6 green
 Dump green then flake then Tamp
 162 tamps

Book 11 =

The higher the heat discharge the colder is the Nickel but on board gets lower

Evidently the Nickel takes a higher Charge when hot after it gets cold but at same time its cold charge gets weaker -

Book 11 2501 - Case where Fe changed after run on board & rerun right away - loses 145 Meah Capacity. as if iron poured it or else new iron was in peculiar Condition possibly gave out fresh Hg & this from Hg seen on Nickel -

(It may be Hg is a bad thing)

(As Oxidation of Hg in cell makes a tenacious film + an insulator)

May be Iron itself goes down after the run test don't do it

9V

| | | 50 | 1/2 | Hot |
|------|------|------|------|-----|
| 2501 | 1243 | 1283 | 1337 | 550 |
| 2502 | 1250 | 1323 | 1373 | 447 |

| | | | | |
|--|--|------|------|-----|
| | | 100 | 1/2 | Hot |
| | | 1283 | 1343 | 430 |
| | | 1307 | 1370 | 403 |

| New | 1/2 | treated by rerunning | out in rerun |
|-----|------|----------------------|--------------|
| | 1127 | 1253 | 533 |
| | 1173 | 1277 | 577 |

| | | | | |
|--|--|------|------|-----|
| | | 150 | 1/2 | Hot |
| | | 1120 | 1177 | 617 |
| | | 1147 | 1200 | 573 |

| # | | 1/2 | H |
|---|------|------|-----|
| | 350 | 1093 | 580 |
| | 1050 | 1167 | 613 |
| | 1090 | | |

Tubes made with flake Copper
plated - gave about Req Capacity
50th Run #11 book 2641-2

Zinc plated tube -

| | Cold | 50 | 1/2 | Hot |
|----------------------|------|------|------|-----|
| I.V. Iron plated | 823 | 757 | 737 | 320 |
| | 807 | 750 | 737 | 387 |
| | Cold | 50 | 1/2 | Hot |
| I.V. Cobalt plated | 1233 | 1240 | 1283 | 421 |
| | Cold | 50 | 1/2 | Hot |
| I.V. Cadmium plated | 1170 | 1193 | 1217 | 450 |
| | Cold | 50 | 1/2 | Hot |
| I.V. Lead plated | 1210 | 1260 | 1293 | 420 |
| | Cold | 50 | 1/2 | Hot |
| I.V. Antimony plated | 967 | 1293 | 1327 | 567 |
| | 987 | 1330 | 1350 | 560 |
| | | 100 | 1/2 | Hot |
| | | 1307 | 1327 | — |
| | | 1273 | 1300 | — |
| | | 150 | 1/2 | Hot |
| | | 1317 | 1350 | 827 |
| | | 1300 | 1320 | 207 |



Note Antimony - if put in solution
low capacity to volt But if Antimony
plated on tube the 1 volt capacity
is ok & has the curious hot high
Capacity -

21K 2 Li 2 K Antimonate

| | Cold | 50 | 1/2 | Hot | 100 | 1/2 | Hot |
|-------|------|-----|------|------|-----|------|-----|
| #1720 | 1207 | 573 | 1347 | 1137 | 690 | 1403 | 933 |
| 21 | 1187 | 610 | 1440 | 833 | 620 | 1407 | 990 |
| 22 | 1183 | 573 | 1407 | 1030 | 567 | 1413 | 690 |

Book #9 -

4 K Antimonate

| | Cold | 50 | 1/2 | Hot |
|--|------|-----|------|------|
| | 1167 | 573 | 1237 | 973 |
| | 1173 | 600 | 1457 | 780 |
| | 1180 | 573 | 1390 | 1067 |

very high

21K No Li - 2 K Antimonate

| | Cold | 50 | 1/2 | Hot |
|--|------|------|------|-----|
| | 1147 | 697 | 1097 | 623 |
| | 1127 | 1107 | 1173 | 377 |
| | 1143 | 767 | 1130 | 623 |

21K No Li 4 K Antimonate

| | Cold | 50 | 1/2 | Hot |
|--|------|-----|------|-----|
| | 1153 | 797 | 1163 | 577 |
| | 1153 | 740 | 1163 | 520 |
| | 1150 | 607 | 967 | 777 |

Be sure of 21K book given
Antimony drop with Antimony

| 21 K 2 li - 2 K Antimony | | | |
|--------------------------|------|-----|-----------|
| | Cold | 50 | 1/2 Hot |
| 1791 | 1283 | 593 | 1530 940 |
| 1792 | 1273 | 633 | 1593 1083 |

This is Dup of 1777 which has
Bismuth flake -

Reg 21 K 2 li - 2 from Antimony
connected to each cube -

| Cold | 50 | 1/2 | H | 100 | 1/2 | H |
|------|------|------|-----|------|------|-----|
| 1240 | 1323 | 1320 | 303 | 1267 | 1283 | 571 |
| 1235 | 1257 | 1270 | 170 | 1203 | 1217 | 560 |

| 150 | 1/2 | H |
|------|------|-----|
| 1267 | 1283 | 740 |
| 1243 | 1253 | 647 |

Ni₂SO₄ - Goldstein 448

1/2% Iron precipitated in green.

| 200th Run | 1333 | 1347 | 497 |
|-----------|------|------|-----|
| | 1310 | 1320 | 478 |

1 1/2% in Goldstein 444

| 150 Run | 1197 | 1217 | 407 |
|---------|------|------|-----|
| | 1123 | 1130 | 323 |

B_1 flake made with $B_{12}O_3$ 1625 cc
 NH₄Cl See Book 10 #1752-1-2
 flake weakened tears by stirring
 showing large part Ni flake
 replaced by B_1 292 Dmp 7.720

| 50 | 1/2 | Hat | 100 | 1/2 | Hat |
|------|------|------|------|------|------|
| 1290 | 1467 | 1527 | 1087 | 1477 | 1610 |
| 1293 | 1457 | 1517 | 1080 | 1477 | 1607 |
| 1283 | 1460 | 1533 | 1007 | 1500 | 1630 |

| 150 | 1/2 | Hat |
|------|------|------|
| 1313 | 1440 | 1180 |
| 1333 | 1473 | 1287 |
| 1327 | 1460 | 1303 |

Do Note high hat.

Re-

RA 1164 8.2 green - 25 lb lot.

4.2 flake 24.1 green - dump green then flake
then lamp 8.105 - green itself 6.871

| Cold | 50 | 1/2 | H | 100 | 1/2 | Hot |
|------|------|------|-----|------|------|-----|
| 1097 | 1210 | 1273 | 247 | 1287 | 1350 | 320 |
| 1080 | 1267 | 1320 | 240 | 1363 | 1420 | 370 |
| 1077 | 1197 | 1307 | 243 | 1300 | 1390 | 387 |

| 1225 | 1300 | 240 | 1316 | | | |
|------|------|-----|------|------|-----|--|
| 150 | 1/2 | Hot | 200 | 1/2 | Hot | |
| 1277 | 1380 | 400 | 1270 | 1450 | 527 | |
| 1357 | 1467 | 423 | 1287 | 1543 | 523 | |
| 1300 | 1420 | 377 | 1263 | 1473 | 520 | |
| 250 | 1/2 | H | 300 | 1/2 | Hot | |
| 1413 | 1453 | 533 | 1330 | 1397 | 580 | |
| 1540 | 1580 | 627 | 1390 | 1477 | 597 | |
| 1473 | 1523 | 577 | 1383 | 1443 | 627 | |

| 350 | 1/2 | Hot |
|------|------|-----|
| 1283 | 1367 | 570 |
| 1260 | 1380 | 590 |
| 1323 | 1413 | 600 |

or Rungs broken

This shows great swelling Capacity
of nickel hydrosulfide less the flake more
the work being more green

Split - 3 Rungs broken

4 flake - 36 green to dump

| 7.800 | 6.934 green | | | | | |
|-------|-------------|------|------|------|------|-----|
| Cold | 50 | 1/2 | Hot | 100 | 1/2 | Hot |
| 1113 | 1350 | 1373 | 267 | 1443 | 1477 | 433 |
| 1087 | 1270 | 1313 | 267 | 1357 | 1430 | 453 |
| 1103 | 1310 | 1353 | 270 | 1438 | 1480 | 553 |
| 150 | 1/2 | Hot | 200 | 1/2 | Hot | |
| 1393 | 1477 | 400 | 1380 | 1533 | 577 | |
| 1313 | 1420 | 383 | 1223 | 1477 | 497 | |
| 1387 | 1450 | 423 | 1330 | 1497 | 433 | |
| 250 | 1/2 | Hot | 300 | 1/2 | Hot | |
| 1437 | 1500 | 587 | 1230 | 1230 | 707 | |
| 1433 | 1507 | 567 | 1230 | 1247 | 710 | |
| 1473 | 1493 | 553 | 1200 | 1330 | 690 | |

Changed Iron

48 green 4 flake -

Split - 3 Rungs broken

| Cold | 50 | 1/2 | Hot | 100 | 1/2 | H |
|------|------|------|------|------|------|-----|
| 1117 | 1350 | 1383 | 320 | 1477 | 1510 | 583 |
| 1080 | 1260 | 1313 | 300 | 1390 | 1457 | 580 |
| 1117 | 1337 | 1360 | 293 | 1460 | 1400 | 697 |
| 150 | 1/2 | Hot | 200 | 1/2 | Hot | |
| 1440 | 1493 | 483 | 1390 | 1543 | 477 | |
| 1327 | 1443 | 420 | 1320 | 1483 | 410 | |
| 1450 | 1507 | 500 | 1420 | 1550 | 487 | |
| 250 | 1/2 | Hot | 300 | 1/2 | Hot | |
| 1460 | 1527 | ? | 1230 | 1323 | 707 | |
| 1480 | 1480 | ? | 1123 | 1247 | 710 | |
| 1477 | 1507 | ? | 1200 | 1330 | 690 | |

Changed Iron

Co

60 green 444
Average of 6 tubes
Cald 50 1/2 Hat 100 1/2 Hat
1115 1325 1353 603 1382 1430 455

150 200 1/2 Hat
1354 1416 590 1342 1383 506 444

250 300 1/2 Hat
1219 1319 582 1177 1270 593

Average 6 72 green 444 1169 green
Cald 50 1/2 Hat 100 1/2 Hat 350
1076 1295 1325 730 1361 1406 421 1287 1341 455

Walking beyond this -

~~Threats from some birds~~ more
Back 10

Reg. tube 21K 2 Li -
2 gms Phosphotungstic Acid in KCl.

Cald 50 1/2 H 100 1/2 Hat
1183 1353 1530 583 1270 1567 1068
1190 1350 1573 973 1363 1510 1153

Note high hat
151.5

KCl 21 1/2 Li - Back 10

Phospho Tungstate K 250 ml/g - # 2015-16-17

Cald 50 1/2 H 100 1/2 H
1197 1310 1377 660 1290 1430 693
1197 1287 1347 570 1287 1407 643
1210 1357 1357 530 1300 1420 690

500 ml/g Phos Tungstate
Cald 50 1/2 H 100 1/2 H 2015-16-22
1190 1283 1350 540 1273 1410 703
1190 1283 1347 583 1243 1440 633
1187 1287 1357 647 1273 1440 632

750 ml/g PWOs - 2021-2-3
Cald 50 1/2 H 100 1/2 H
1220 1313 1410 757 1237 1490 740
1210 1313 1383 723 1287 1470 723
1207 1313 1383 750 1273 1480 823

Book 10

1 gram Phosphotungstate K 2024-5-6

| Cold | 50 | 1/2 | H | 100 | 1/2 | Hot |
|------|------|------|-----|------|------|-----|
| 1207 | 1313 | 1463 | 753 | 1287 | 1487 | 830 |
| 1220 | 1290 | 1413 | 917 | 1280 | 1500 | 817 |
| 1210 | 1287 | 1387 | 627 | 1220 | 1473 | 800 |

1/2 gram Phosphotungstate

| Cold | 50 | 1/2 | Hot | 100 | 1/2 | Hot |
|------|------|------|-----|------|------|-----|
| 1213 | 1323 | 1450 | 587 | 1120 | 1623 | 863 |
| 1193 | 1290 | 1433 | 587 | 1100 | 1617 | 783 |
| 1207 | 1290 | 1440 | 817 | 1170 | 1580 | 840 |

Note 100th Run To 1/2 v

There is something in this phosphotungstate of K - try 2 - 2 1/2 - 3 - & 4 grams to a test cell -

Try Borosulfamate of K

Phosphotung. is acid acting on 4 yr black nitro's makes lots of Colours in much water None with Phos Molybdate

Lot of Reqs with different flake when we were Org & Experimenting

Book 8

750 Run Chg Fe

| 9660-2 | 700 | 1/2 | Hot | 750 | 1/2 | Hot |
|--------|------|------|-----|------|------|-----|
| 9661 | 960 | 1350 | 707 | 940 | 1217 | 720 |
| | 1027 | 1373 | 673 | 1047 | 1350 | 780 |

changed Fe

| 750 | 1/2 | Hot |
|-----|------|-----|
| 897 | 1077 | 660 |
| | 1233 | 680 |

Co

Fe - not changed

| 9662 | 700 | 1/2 | H | 750 | 1/2 | H | 800 | 1/2 | H |
|------|------|------|-----|------|------|-----|------|------|-----|
| 9663 | 1240 | 1507 | 740 | 1080 | 1437 | 750 | 900 | 1350 | 663 |
| | 1110 | 1433 | 647 | 1133 | 1440 | 700 | 1000 | 1313 | 637 |

Co

9491-2

| 700 | 1/2 | H | 750 | 1/2 | H | 800 |
|------|------|-----|------|------|-----|------|
| 1067 | 1407 | 627 | 1213 | 1413 | 676 | 1123 |
| 1063 | 1297 | 520 | 1133 | 1243 | 573 | 1083 |

changed Fe

| 850 | 1/2 | H |
|------|------|-----|
| 1050 | 1107 | 700 |
| 1037 | 1077 | 733 |

Co

There are several more at same place in book 8

600k 8
723 green - sheaves flake made as now

24 green 3 mil flake each dump

| Cold | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
|------|------|------|------|------|------|------|------|------|
| 1240 | 1313 | 1400 | 1400 | 1437 | 1400 | 1400 | 1357 | 1363 |
| 1233 | 1300 | 1363 | 1363 | 1410 | 1380 | 1390 | 1363 | 1340 |

2 mil flake each dump

| Cold | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 |
|------|------|------|------|------|------|------|------|------|
| 1257 | 1350 | 1400 | 1363 | 1433 | 1390 | 1403 | 1350 | 1303 |
| 1260 | 1350 | 1410 | 1460 | 1433 | 1400 | 1397 | 1317 | 1313 |

9 remark that changing vrons seems to

Change Fe

| 450 | 500 | 550 | 600 | 650 | 700 |
|------|------|------|------|------|-----|
| 1200 | 1223 | 1083 | 1220 | 967 | 887 |
| 1333 | 1327 | 1220 | 1330 | 1057 | 947 |

C Fe

| 450 | 500 | 550 | 600 | 650 | 700 |
|------|------|------|------|-----|-----|
| 1227 | 1193 | 1090 | 1217 | 987 | 807 |
| 1223 | 1223 | 1003 | 943 | 573 | 790 |

hunt, but if Bi is used it improves capacity



Soaking old bad tubes.

Only ones quinned is

| | |
|---------------------------------------|-----------------------------------|
| Conc Potassium Bichromate | 34 mah |
| Strong Zn Chloride | 66 |
| NH ₄ K ₂ strong | 120 |
| Na Nitrite - strong | 147 |
| Zn Sulphate " | 140 |
| K Chlorate | 50 |
| Arsenate Na | 1 tube lost 200 other quinned 200 |

Nitrate Ammonia brightened up everything
Neither quinned or lost,

Book 22 - think previous book
has more -

Following Materials put in
tubes with flask Reg way but
no Nickel added - 21 K 21

| | Oxide | 50 | 1/2 | Hol |
|---------------------------|-------|-----|-----|-----|
| 6.700 Cerium hydrox | 20 | 0 | 0 | 10 |
| 6.500 Nickel Molybdate | 265 | 0 | 0 | 310 |
| 9.5 Barium Chromate | 10 | 0 | 0 | 10 |
| 8.5 Strontia " | 0 | 0 | 0 | 0 |
| 6.200 Calcium " | 33 | 0 | 0 | 72 |
| 8.5 Cadmium " | 33 | 0 | 0 | 39 |
| 7.7 Cerium Molybdate | 1 | 0 | 0 | 7 |
| 6.7 Iron Chromate | 1.7 | 0 | 0 | 72 |
| 6.000 Ni " | 145 | 487 | 520 | 425 |
| 6.5 Cobalt " | 0 | 120 | 120 | 307 |
| 4.5 Magnesia Oxalate | 0 | 0 | 0 | 0 |
| 10.400 CaWO ₃ | 0 | 0 | 0 | 0 |
| 15.50 Hg Chromate | 1093 | 70 | 105 | 72 |
| 10.700 Strontia Tungstate | 13 | 30 | 37 | 23 |
| 7.100 " Fluoride | 8 | 30 | 37 | 23 |

~~My Experiment of soaking grain
in different strengths of Cobalt
sulphate~~

3

1326

2007

145

2411

My Expts soaking Cobalt Sulphate
in Green - Solution containing the
percent of acids as say

| | 50 | 1/2 | 11 | 100 | 1/2 | 11 | 130 |
|--------------------|------|------|-----|------|------|-----|--------|
| 3% ^{conc} | 1328 | 1342 | 473 | 1271 | 1411 | 508 | (133) |
| 5% | 1308 | 1323 | 502 | 1261 | 1383 | 522 | (1313) |
| 7% | 1329 | 1344 | 482 | 1259 | 1413 | 527 | (1369) |
| 10 | 1313 | 1329 | 454 | 1252 | 1396 | 548 | 1341 |
| 15% | 1288 | 1307 | 508 | 1239 | 1392 | 575 | 1342 |
| 20% | 1298 | 1327 | 531 | 1322 | 1428 | 559 | 1332 |
| 25% | 1361 | 1380 | 560 | 1398 | 1437 | 612 | 1429 |
| 35% | 1378 | 1396 | 623 | 1365 | 1421 | 633 | 1420 |

| Red Green | 1% | Uranium hyd | residue | Wt |
|-----------|------|-------------|---------|-------|
| Col | 50 | 1/2 | 100 | 7.450 |
| 1150 | 1363 | 1387 | 1421 | 1453 |
| 1123 | 1360 | 1313 | 1377 | 707 |
| 1160 | 1363 | 1387 | 1410 | 1430 |

loading 7.450

Uranium
Important to
Repeat with this

Weight 3% 7.193
5 7.193
7 7.136
10 7.179
15 7.188

| 1/2 | H | 200 | 1/2 | H | 250 | 1/2 | H | 300 | 1/2 | H |
|------|-----|-------|------|-----|--------|------|-----|--------|------|-----|
| 1435 | 580 | 1144 | 1308 | 674 | CO | | | | | |
| 1388 | 559 | 1175 | 1348 | 644 | CO | | | | | |
| 1443 | 570 | 1151 | 1323 | 604 | CO | | | | | |
| 1404 | 565 | 1207 | 1466 | 638 | 1156 | 1324 | 633 | 1066 | 1275 | 577 |
| 1415 | 650 | (391) | — | 723 | 1271 | 1416 | 606 | 1209 | 1355 | 725 |
| 1408 | 678 | 1329 | — | 677 | (1222) | 1440 | 732 | 1226 | 1378 | — |
| 1481 | 833 | 1421 | — | 681 | 1397 | 1515 | 705 | (1352) | 1469 | 766 |
| 1473 | 844 | 1404 | — | 757 | 1377 | 1491 | 658 | 1349 | 1449 | 761 |

Experiment
bright yellow

| 1/2 | H | 200 | 1/2 | H | 250 | 1/2 | H | 300 | 1/2 | H |
|------|-----|------|------|-----|------|------|-----|------|------|-----|
| 1487 | 765 | 1443 | 1527 | 787 | 1430 | 1557 | 767 | 1397 | 1483 | 750 |
| 1387 | 680 | 1380 | 1453 | 723 | 1380 | 1480 | 733 | 1393 | 1477 | 567 |
| 1483 | 723 | 1417 | 1483 | 790 | 1430 | 1493 | 697 | 1323 | 1397 | 707 |

Uranium hyd probably oxide to
Uranic oxide combine with
H₂ to form Uranate which
is absolutely insol in H₂O
at Cement. M₂X like Bi sulphide
U₂SO₄ Controls

| | 350 | 1/2 | H | 400 | 1/2 | H |
|-----|------|------|-----|--------|--------------|---|
| 10% | 1148 | 1349 | — | | | |
| 15 | | | | | | |
| 20 | | | | | | |
| 25% | 1077 | 1338 | 642 | 1237 | 1412 | |
| 35 | 1122 | 1360 | 704 | 1269 | 1488 | |
| | | | | 7 runs | | |
| | | | | | 1480 to 1485 | |
| | | | | | 1485 to 1490 | |
| | | | | | 1490 to 1495 | |
| | | | | | 1495 to 1500 | |
| | | | | | 1500 to 1505 | |
| | | | | | 1505 to 1510 | |
| | | | | | 1510 to 1515 | |
| | | | | | 1515 to 1520 | |
| | | | | | 1520 to 1525 | |
| | | | | | 1525 to 1530 | |
| | | | | | 1530 to 1535 | |
| | | | | | 1535 to 1540 | |
| | | | | | 1540 to 1545 | |
| | | | | | 1545 to 1550 | |
| | | | | | 1550 to 1555 | |
| | | | | | 1555 to 1560 | |
| | | | | | 1560 to 1565 | |
| | | | | | 1565 to 1570 | |
| | | | | | 1570 to 1575 | |
| | | | | | 1575 to 1580 | |
| | | | | | 1580 to 1585 | |
| | | | | | 1585 to 1590 | |
| | | | | | 1590 to 1595 | |
| | | | | | 1595 to 1600 | |
| | | | | | 1600 to 1605 | |
| | | | | | 1605 to 1610 | |
| | | | | | 1610 to 1615 | |
| | | | | | 1615 to 1620 | |
| | | | | | 1620 to 1625 | |
| | | | | | 1625 to 1630 | |
| | | | | | 1630 to 1635 | |
| | | | | | 1635 to 1640 | |
| | | | | | 1640 to 1645 | |
| | | | | | 1645 to 1650 | |
| | | | | | 1650 to 1655 | |
| | | | | | 1655 to 1660 | |
| | | | | | 1660 to 1665 | |
| | | | | | 1665 to 1670 | |
| | | | | | 1670 to 1675 | |
| | | | | | 1675 to 1680 | |
| | | | | | 1680 to 1685 | |
| | | | | | 1685 to 1690 | |
| | | | | | 1690 to 1695 | |
| | | | | | 1695 to 1700 | |
| | | | | | 1700 to 1705 | |
| | | | | | 1705 to 1710 | |
| | | | | | 1710 to 1715 | |
| | | | | | 1715 to 1720 | |
| | | | | | 1720 to 1725 | |
| | | | | | 1725 to 1730 | |
| | | | | | 1730 to 1735 | |
| | | | | | 1735 to 1740 | |
| | | | | | 1740 to 1745 | |
| | | | | | 1745 to 1750 | |
| | | | | | 1750 to 1755 | |
| | | | | | 1755 to 1760 | |
| | | | | | 1760 to 1765 | |
| | | | | | 1765 to 1770 | |
| | | | | | 1770 to 1775 | |
| | | | | | 1775 to 1780 | |
| | | | | | 1780 to 1785 | |
| | | | | | 1785 to 1790 | |
| | | | | | 1790 to 1795 | |
| | | | | | 1795 to 1800 | |
| | | | | | 1800 to 1805 | |
| | | | | | 1805 to 1810 | |
| | | | | | 1810 to 1815 | |
| | | | | | 1815 to 1820 | |
| | | | | | 1820 to 1825 | |
| | | | | | 1825 to 1830 | |
| | | | | | 1830 to 1835 | |
| | | | | | 1835 to 1840 | |
| | | | | | 1840 to 1845 | |
| | | | | | 1845 to 1850 | |
| | | | | | 1850 to 1855 | |
| | | | | | 1855 to 1860 | |
| | | | | | 1860 to 1865 | |
| | | | | | 1865 to 1870 | |
| | | | | | 1870 to 1875 | |
| | | | | | 1875 to 1880 | |
| | | | | | 1880 to 1885 | |
| | | | | | 1885 to 1890 | |
| | | | | | 1890 to 1895 | |
| | | | | | 1895 to 1900 | |
| | | | | | 1900 to 1905 | |
| | | | | | 1905 to 1910 | |
| | | | | | 1910 to 1915 | |
| | | | | | 1915 to 1920 | |
| | | | | | 1920 to 1925 | |
| | | | | | 1925 to 1930 | |
| | | | | | 1930 to 1935 | |
| | | | | | 1935 to 1940 | |
| | | | | | 1940 to 1945 | |
| | | | | | 1945 to 1950 | |
| | | | | | 1950 to 1955 | |
| | | | | | 1955 to 1960 | |
| | | | | | 1960 to 1965 | |
| | | | | | 1965 to 1970 | |
| | | | | | 1970 to 1975 | |
| | | | | | 1975 to 1980 | |
| | | | | | 1980 to 1985 | |
| | | | | | 1985 to 1990 | |
| | | | | | 1990 to 1995 | |
| | | | | | 1995 to 2000 | |
| | | | | | 2000 to 2005 | |
| | | | | | 2005 to 2010 | |
| | | | | | 2010 to 2015 | |
| | | | | | 2015 to 2020 | |
| | | | | | 2020 to 2025 | |
| | | | | | 2025 to 2030 | |
| | | | | | 2030 to 2035 | |
| | | | | | 2035 to 2040 | |
| | | | | | 2040 to 2045 | |
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| | | | | | 2050 to 2055 | |
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| | | | | | 2065 to 2070 | |
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| | | | | | 2080 to 2085 | |
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| | | | | | 2090 to 2095 | |
| | | | | | 2095 to 2100 | |
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| | | | | | 2105 to 2110 | |
| | | | | | 2110 to 2115 | |
| | | | | | 2115 to 2120 | |
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| | | | | | 2125 to 2130 | |
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| | | | | | 2280 to 2285 | |
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| | | | | | 2295 to 2300 | |
| | | | | | 2300 to 2305 | |
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| | | | | | 2375 to 2380 | |
| | | | | | 2380 to 2385 | |
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| | | | | | 2395 to 2400 | |
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| | | | | | 2595 to 2600 | |
| | | | | | 2600 to 2605 | |
| | | | | | 2605 to 2610 | |
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| | | | | | 2640 to 2645 | |
| | | | | | 2645 to 2650 | |
| | | | | | 2650 to 2655 | |
| | | | | | 2655 to 2660 | |
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| | | | | | 2665 to 2670 | |
| | | | | | 2670 to 2675 | |
| | | | | | 2675 to 2680 | |
| | | | | | 2680 to 2685 | |
| | | | | | 2685 to 2690 | |
| | | | | | 2690 to 2695 | |
| | | | | | 2695 to 2700 | |
| | | | | | 2700 to 2705 | |
| | | | | | 2705 to 2710 | |
| | | | | | 2710 to 2715 | |
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| | | | | | 2750 to 2755 | |
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| | | | | | 2760 to 2765 | |
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| | | | | | 2770 to 2775 | |
| | | | | | 2775 to 2780 | |
| | | | | | 2780 to 2785 | |
| | | | | | 2785 to 2790 | |
| | | | | | 2790 to 2795 | |
| | | | | | 2795 to 2800 | |
| | | | | | 2800 to 2805 | |
| | | | | | 2805 to 2810 | |
| | | | | | 2810 to 2815 | |
| | | | | | | |

For full runs on $\frac{1}{2}$ def % of
Hq see $\frac{1}{2}$ book marked
X on Cover

Tubes not plated - but annealed
Wt 7.000 — 21K2 Li 12.5% q-mn

| | | | | |
|------|------|------|------|------|
| 50 | 100 | 200 | 250 | 300 |
| 1260 | 1288 | 1355 | 1250 | 1275 |

350
1030

M. St. prep with only
theoretical amount of
NaOH.

| | | |
|-------|------|----|
| 50 | 100 | |
| 1210. | 1237 | Co |

Goldstein 659 - $1\frac{1}{2}\%$ Co - MnO₂ 7.230 wt

| | | | | | |
|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 |
| 1406 | 1450 | 1445 | 1390 | 1380 | 1196 |

350
1270

$3\frac{1}{2}\%$ Co -

209 Mah per gram bar
6.830 wt

| | | | | | |
|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 |
| 1412 | 1432 | 1373 | 1250 | 1200 | 1150 |

350
1120

$4\frac{1}{2}\%$ Co

6.900 wt

| | | | | |
|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 |
| 1420 | 1401 | 1260 | 1275 | 1150 |

300
1120

5% no bell's Urease
6.600, wt
Also
has changed
more
also run on
broadened

7117 - Goldstem 621 12% B⁺

Can not plated inside - Nickel
tubs Connected to Can
Hydrogen tank

| | | | | | |
|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 |
| 1635 | 1710 | 1533 | 1570 | 1533 | 1640 |

| | | | |
|------|------|------|------|
| 350 | 400 | 450 | 500 |
| 1417 | 1033 | 1063 | 1153 |

Keep Hydrogen
tanks

Iron Connected to Can

| | | | | | | |
|------|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 | 350 |
| 1467 | 1443 | 1400 | 1242 | 1383 | 1280 | 1254 |

| | | |
|------|------|-----|
| 400 | 450 | 500 |
| 1300 | 1197 | 917 |

Abrogant Co 1% last link

| | | | | | |
|------|------|------|------|------|------|
| 50 | 100 | 150 | 200 | 250 | 300 |
| 1392 | 1410 | 1423 | 1390 | 1407 | 1347 |

| | | | |
|------|------|------|------|
| 350 | 400 | 450 | 500 |
| 1200 | 1100 | 1143 | 1053 |

Nickel tubs not plated

Can't be used with Bromine
Goldstem 621 12% B⁺ test tube

| | | | |
|------|------|-----|-----|
| 50 | 100 | 150 | 200 |
| 1610 | 1180 | 567 | 607 |

showed Irons OK

This is a clue

Try pure H₂

5% Erbium hydrox pump in Ni^{OH}

Coed 50 1/2 Hat Note Hat
1063 980 993 720

5724 Dry H₂O₂ Ni^{OH} in Rails

7566, lot

probably present in bulk

| | | | |
|------------|------|------|----------------|
| 400 Rm bed | 450 | 700 | 750 split plan |
| 1533 | 1433 | 1123 | 1180, 1180 |

Something will

Green & Flake from cells 1690 to
 1695 after running 600 lines
 removed treated with glycerine
 KOH, to reduce - flocculated
 cell flake & treated it with
 $2\frac{1}{2}\%$ H_2SO_4 - green washed
 free of glycerine momentarily
 washed in $2\frac{1}{2}\%$ H_2SO_4 -
 Reloaded 27 grm. 0083 flake
 2.15 Dumps 7560 lb

| | | | | | |
|---|------|------|-----------------|-----|------------------------------|
| S | Cold | 50 | $\frac{1}{2}$ H | 100 | $\frac{1}{2}$ H ₂ |
| | 1513 | 1491 | 1523 | 967 | 1350 1460 993 |
| | 1507 | 1480 | 1527 | 970 | 1357 1513 1027 |

| | | | |
|------|-----------------|------|-----------------|
| 150 | $\frac{1}{2}$ H | 200 | $\frac{1}{2}$ H |
| 1320 | 1433 | 977 | 1250 950 |
| 1320 | 1448 | 1003 | 1170 1267 853 |

| | | | |
|------|-----------------|-----|-----------------|
| 250 | $\frac{1}{2}$ H | 300 | $\frac{1}{2}$ H |
| 1287 | 1367 | 863 | 937 1020 847 |
| 1297 | 1390 | 863 | 1073 1123 890 |

Req short (old tubes) soaked
 6 tubes - soaked in gallon $2\frac{1}{2}\%$
 KOH for a week gave not a
 trace of LiOH in the gallon
 Anyhow of tubes gave 700
 mg of LiOH + 1800 mg
 KOH per tube - on long
 tube this is 1 gm LiOH
 that stays in tubes of kept
 in $2\frac{1}{2}\%$ KOH,

It must combine

Holland, test of big cell in
 water changed from lime
 to lime showed LiOH.

Kept coming out after KOH,
 was practically all removed
 H₂ has risen

M. L. O'Connor
 Tubes in $2\frac{1}{2}\%$ KOH
 but clean and
 in water

Take 100 of our Rubber separators

5 or 6 (at 4 trial)

1st HCl -

2 Acetone

3 ^{Amalgam} Depreciate

4 ^{anhydrous} ROH 2 1/2 li. hot,

6 Chloroform

Evaporate to dryness of
each lot to see what
residue -

Allyl to

Try 2 test cells, (the
Electrolytic Salts) - Allyl to
LiOH 10% -
Carbonate Pelast.

The Material from 4
Returned Adams &

Cells 100 amp hours
taken out by

Smith is in
Christmas hands
Experiment on it

Goldstein Book 19=

Dry Ni 504 & Dry NaOH. mixed in Rolls

washed & dried at 130 Fahr - 7561-7473

| Cold | 50 | 100 | 200 | 300 | 500 | 700 | 900 |
|------|------|------|------|------|------|-----|------|
| 1217 | 1362 | 1450 | 1447 | 1450 | 1283 | 113 | 1417 |
| 1248 | 1360 | 1483 | 1483 | 1480 | 1310 | 113 | 1207 |

had to proceed in Carbon which 300 absorption
ditto

Dried 160 - 7318 - 7308

| Cold | 50 | 100 | 200 | 300 | Co |
|------|------|------|------|------|----|
| 1237 | 1361 | 1450 | 1457 | 1474 | |
| 1270 | 1375 | 1477 | 1377 | 1471 | |

Made Lamp of Drying -

A tube which loads
9.000 after drying 48 hour
at 212 Fahr scales 7662
7700

Ni mix from old cells -
separating flake from Ni -

| Chemical | hour | Ni dissolved |
|---------------------|---------------------------------------|----------------------|
| K Bichrom | 72 | none |
| K Oxalate | 72 | Much |
| K Arsenite | 24 - green | all runs thru filter |
| K Sulphite | 52 Green | Much |
| K Cy | 24 Yellow | " |
| K Hydrogen sulphite | 52 Green | " |
| K Bicarboate | 72 | " |
| K Iodide | 72 Brown | none |
| K Formate | 48 G. time | Some |
| K Sulphite | 48 | Some |
| K Hypophosphite | 24 none | none |
| K Hypophosphorus | 48 | none |
| K Oxalate | 24 green | Much |
| K Carbonate | 96 | Some |
| K Sulfoarsenite | 96 | " |
| Rochelle Salt | 96 | " |
| K Cyanate | 96 V. green | Much |
| K Formate | 48 | None |
| K Selenite | 30 large pieces sol H ₂ O. | Some |
| K Tartrate | 96 | Some |
| Na Cy | 96 Brown | Much |
| Na Hyposulphite | 48 | None |
| Na Sulphite | 48 | None |

Chemical by hours N. dissolved

| | | | | |
|----------------------|----|---------|---------|--------------|
| Na Bisulfite | 48 | 48 | V green | much |
| Na Sulphate | 48 | | | None |
| Na Sulphocarbonate | 96 | green | | much |
| Alk. (Lake des Lacs) | | | | lots Sulphur |
| Na Peroxide | 48 | | | None |
| Na Lactate | 48 | | | Some |
| Na Sulphaminate | 48 | | | None |
| Na Sulphatethyale | 48 | V green | | much |
| Na & K Sulphate | 96 | | | None |
| Na Bismutide | 48 | V green | | much |
| Na Ferrocyanide | 48 | | | Some |
| Na Tetraoxalate | 96 | V green | | much |
| Na Persulphate | 96 | green | | much |
| Na Bromate | 96 | | | None |
| Na Chlorate | | | | None |
| Na glycerophosphate | 96 | | | None |

3% H₂O₂ gives very much separated in about 10 hours no N. dissolved

Specific gravity

| | NaOH | KOH |
|----|-------|-------|
| 10 | 1.012 | 1.083 |
| 15 | 1.170 | 1.128 |
| 20 | 1.225 | 1.177 |
| 25 | 1.279 | 1.230 |
| 30 | 1.332 | 1.288 |

1st 50 Hot runs Comparison between NaOH & KOH old green & thick

| | V | % | Difference | % None |
|-----|-----|------|------------|--------|
| 33% | 718 | 324 | - | 42.9 |
| 31 | 646 | 718 | + 72 | 40.3 |
| 29 | 820 | 855 | 35 | 37.7 |
| 27 | 844 | 998 | 154 | 35.1 |
| 25 | 905 | 991 | 86 | 32.5 |
| 23 | 899 | 1005 | 106 | 29.9 |
| 21 | 904 | 993 | 89 | 27.3 |
| 19 | 933 | 905 | = 28 | 24.7 |
| 17 | 931 | 907 | = 24 | 22.1 |
| 15 | 915 | 907 | = 8 | 19.5 |
| 13 | 881 | 903 | + 22 | 16.9 |
| 11 | 855 | 914 | 59 | 14.3 |
| 9 | 813 | 877 | 64 | 11.7 |
| 7 | | 830 | | |

21% KOH saturated with LiOH. Contains
in 100 cc 2.9586 milgms LiOH.

15% NaOH saturated contains 3.2936
milgms LiOH.

K Stearate Sol 21% KOH, almost insol in
21% KOH saturated with LiOH.

With the Cobalt-Oulfate test 3% to
35% Each 5% increase ~~reduces~~ life
50 Runs -

Req 7.500 gram soaked in strong Cobalt
sol dried & ppd in gram gives loading
acts up 7.160. Probably makes it
harder & prevents heavy loading by
deforming. Evidently most NiOH
will give heavy loading by deforming
a porous gram sample gives burst
that must be reason why NiOH is
so surprisingly well when pores
filled with BaSO₄ etc -
Here is a clue -

Heavy loading acts in many cases
give only 1090 to 1100 on 50th run

3% Cobalt boy up to 35% soaked in
Req gram gives 7.160 to 7.210
for every degree of strength,
clue

9. Failure in working Ni Res.
 soaking in Conc Cobalt Chloride
 that it was very difficult
 to get the Chloride but many washings
 & 4 days soak - Evidently pores
 are very fine being filled with
 CoSO_4 & thus circulation very
 sluggish for chloride -
 Also this must harden ground
 & give low landing lot.

A later experiment shows that the
 water used to lot of Ni was
 entirely too small.
 Mass action probably
 comes in - Using same dish
 & $1/10$ of the Ni got OK
 with $1/5$ of the washing
 of the big lot.

854 gress.

| | | | | |
|-------|--------|-------|-------|--|
| 2 lbs | 1 dump | L. Wt | 5.521 | } .381 -125 .303 -69 46 gram .9 of gram only |
| 2 1/2 | " | | 5.902 | |
| 3 | " | | 6.027 | |
| 4 | " | | 6.33 | |
| 4 1/2 | " | | 6.399 | |
| 5 | " | | 6.445 | |

3325 =

1164 gress/mixed with 15% K_2CO_3 11m 30 mesh
 on 190 41 1/2 484 gress 134 dump
 L. Wt 7000

| | | | |
|------|------|------|------|
| Cold | 50 | 100 | 150 |
| 883 | 1180 | 1387 | 1183 |
| 3550 | 793 | 870 | 887 |

Dup 25% K_2CO_3

Goldstein 519 = Book 16 -

25% Cobalt wt 7693

| | | | | | | |
|------|------|------|------|------|------|------|
| Cold | 50 | 100 | 150 | 200 | 250 | 300 |
| 927 | 1370 | 1500 | 1467 | 1460 | 1450 | 1360 |
| 917 | 1316 | 1450 | 1413 | 1407 | 1367 | 1367 |

| | | |
|------|------|------|
| 350 | 400 | 450 |
| 1290 | 1200 | 1170 |
| 1247 | 1290 | 1150 |

30% Co wt 7652

| | | |
|------|------|------|
| Cold | 50 | 150 |
| 953 | 1377 | 1393 |
| 933 | 1340 | 1283 |

50% Cobalt wt 7362

| | | | |
|------|------|------|------|
| Cold | 50 | 100 | 150 |
| 784 | 1247 | 1207 | 1290 |
| 750 | 1247 | 1270 | 1267 |

All high wet

Following Mercury Salts Sol in

21 KOH 2 high without precipitation

| | |
|------------------------------------|--------------|
| Phosphoglymma Acetate | Con. Sol |
| Aracetate Hg | Sol |
| Naphtho-Lactate Hg | " |
| Hg Glucosamine | " |
| Hg Succinate | " |
| Mercuric Cy | Very Sol |
| Hg Sulfide | " |
| Hg Salicylate | " |
| Hg Methylchloride & Ethyl Chloride | " |
| Hg Oxycynide | large amount |
| Amide-Propionate | " |
| Hg Malate | fair |
| Mercaptide Hg | Extrem Sol |
| Hg anagmate | Very Sol |
| Phenyl Acetate | " |
| Thymolate | Sol |
| Hg Iodoquinic | quite Sol |
| Hg Resorcin Acetate | " |



2 grms Dinitrobenzine -
 Cold 1225 } 50 Run 173 to Valt
 but 1/2 Valt is 1633 5 55
 1620 . . .

Acetanilid 2 grms Cold 1190 50 Hot is
 153 to V 1/2 is 153 1210
 183 1510 5 5

Picric Acid Cold 840 } 50 Hot
 137 to V 1/2 is 1427 5 Hot 510
 130- 1426 440

Benzidine Cold 1068 50 Hot
 523 to V 827
 583 767 to 1/2

Hydroquinon
 K Silicofluoride
 Camphoric acid
 K Fluoride
 Rosolic acid

50 Hot is
 higher than
 Cold run

Quinidine
 Quinine
 Benzophenone
 Monobromobenzene
 Carbazol
 Cresatinic acid
 Trichlorophenol
 Amidazo-Benzine

} higher after
 50 runs
 than Cold

Dinitrofluor Cold 1157 50 Hot 400 to V
 1203 1460
 1/2 V is 1500

Cresol 363 Cold 50 Hot 423 to V
 1/2 433 440
 450 2

Carbon trichloride
 Monomethylcyanhydride
 Benznaphthal
 Nitro-beta Naphthol
 Sodium Stannate

} higher after
 50 Hot
 than Cold

~~Sample~~

Telluric acid. Cold 1147 50 Hot

1070 1/2 1090
1047 1063

RA 1052-
Green dried in drum from ^{McKean} Rolla
much - blowing air thru
drum which was heated from
outside; Loading Lots

6.410 S. = Cold 1013
1020

50 Run 1140 to V 1157 1/2 V-
1190

9 VM. L. RA 1189 Lwt 6552
1191 6456

1194 6.640

1195 6.746

1196 6.140

1198 6.875

Most give 1160 to 1200 at
end 180 Run

Flake coated very lightly with
Antimony by heating it 24 hours in
SbCl₃ NH₄Cl

Cold

783 50 1/2 H
683 1280 1210 850
1177 1217 966

Lwt 7.460

Another - 100 1/2 H+1
gave higher 1100 1160 1053
943 877 917 950
C. 947 947 947

Note hot,

RA Light green average Lwt 6.200
Run thru Rolla after being wet with
5% H₂O. 275 Dumps Lwt 7.935

New green book 11 No 2515
Treated with ~~fluorine~~ ~~phosphoric~~
acid at ~~1000~~ ~~1000~~ ~~1000~~
Green 50 No 2515
Red 50 No 2515
Green 50 No 2515
Red 50 No 2515
Green 50 No 2515
Red 50 No 2515
Green 50 No 2515
Red 50 No 2515

Goldstein

10% Cobalt precip in grain, Goldstein

out #4229
 L wt 6.688 - Cal 50 1/2 H
 6.690 - 777 1020 1063 350
 1033 1063 350
 100 1/2 Hot
 1060 1080
 1087 1097 367
 423

#4231
 15% Cobalt in grain
 L wt 6.814 - Cal 50 1/2 H
 6.890 - 710 1003 1063 403
 714 1020 1063 423

20% L wt 6.644
 6.666
 Cal 50 1/2 H
 390 920 933 420
 387 923 933 420

25% 519 - #4315
 L wt 7.603
 565
 Cal 50 1/2 H
 927 1370 1400 870
 917 1367 1400 833
 150

100 1/2 H
 1507 1513 920
 1450 1500 847
 200 300
 1460 1360
 1407 1367
 450
 1313
 1150

#4315

30% Cobalt L wt 7.602
 7.652
 Cal 50 150
 983 1337 1393 Co
 933 1390 1383

50% Co - L wt 7.362
 7.516
 Cal 50 100 Hot
 783 1257 1327 840
 750 1247 1270 800

150
 1290
 1267 - should have been
 run longer on brand

#4325 Goldstein L wt 7.462
 7.531
 Cal 50 100 1/2 Hot
 1020 1393 1507 1547 897
 1012 1367 1523 1570 887
 300 Run 450 1/2 Hot
 1367 1127 1247 673
 1353 1147 1223 700

15% 153 per gram Solen
 15 148
 20 133
 25 150
 30 150
 35 170
 50 170

} Unreliable

50% Copper precip in form

| Cold | 50 | 1/2 | Hot |
|------|------|------|------|
| 907 | 1037 | 1050 | 1407 |
| 890 | 1037 | 1050 | 390 |

50% Barium OH in grain

| Cold | 50 | 1/2 | Hot |
|------|------|------|-----|
| 970 | 1000 | 1017 | 630 |
| 977 | 1017 | 1033 | 630 |

50% Iron

| Cold | 50 | 1/2 | Hot |
|------|-----|-----|-----|
| 193 | 253 | 313 | 50 |
| 187 | 267 | 297 | 53 |

50% Manganese OH

| Cold | 50 | 1/2 | Hot |
|------|-----|-----|-----|
| 250 | 497 | 520 | 317 |
| 250 | 470 | 507 | 397 |

25% Cobalt precip

| Cold | 50 | 150 | 350 | 1/2 | Hot |
|------|------|------|------|------|-----|
| 1067 | 1453 | 1393 | 1353 | 1427 | 563 |
| 1083 | 1490 | 1400 | 1340 | 1440 | 553 |

| 500 | 1/2 | Hot |
|------|------|-----|
| 1190 | 1377 | 847 |
| 1193 | 1350 | 860 |



Using 1 gram Aluminum in Small Cell - ZRE is only one that helps. The 1/2 Volt is high

| #4472 - Cold | 50 | 1/2 | Hot |
|--------------|-----|------|-----|
| 1127 | 653 | 1533 | 320 |
| 1133 | 600 | 1493 | 323 |

100 Run
No dischg

4760-1

Conc. NiSO_4 a 33% NaOH precip.
pressed in Cloth. Crumbles with finger.
Very bulky Loading wt 6.502
Cold 6.557

Cold
923 100
943 1150
1240

Deep pressed in Cake at 100 atmos
LW 6.829
6.821

Cold 100
927 1200
923 1240

Talbot's Make # 5702
LW 7.869 Dry NiSO_4 + Dry NaOH
7.865

Made in rolls dried in steam box
90 @ 85 Cent pressed 300 atmos $1/8$ " Cake

Cold 50 300 500
1200 1303 1430 1347
1220 1353 1467 1333

650 Split + place some swollen
1110 badly Swollen
943

Another one 450 700
1433 1123
1173 1013

$\text{Ni}(\text{OH})_2$ Loading 8.000
Dried 212 for 48 hours
Loaded 7.662
7.700

Cold 50 100
1237 1293 1250
1233 1280 1240

Req Ni -

3 gms Manganic hydrox

| Cold | Hot |
|-------|--------|
| 115.7 | 118.20 |
| 933 | 1243 |

Hot
857
827

1 gm Manganic in cell

| Cold | Hot |
|------|------|
| 1173 | 1263 |
| 1157 | 1260 |

| 1/2 | Hot | 250 |
|------|-----|------|
| 1500 | 823 | 1353 |
| 1270 | 857 | 1330 |

143 gms ZnO₄, lower on 50 than on Cold

The sulphate Calant -
Series 3% to 35%

| average | 50 | 1/2 | Hot |
|---------|------|------|-----|
| 10% | 1341 | 1404 | 565 |
| 15 | 1342 | 1415 | 680 |
| 20 | 1332 | 1408 | 675 |
| 25 | 1429 | 1481 | 833 |
| 35 | 1420 | 1473 | 849 |

} 50th

| | 1/2 | Hot |
|----|------|------|
| 10 | 1156 | 1324 |
| 15 | 1271 | 1416 |
| 20 | 1322 | 1440 |
| 25 | 1397 | 1515 |
| 35 | 1377 | 1491 |

} 250 Run

| | 1/2 | Hot |
|----|------|------|
| 10 | 1066 | 1275 |
| 15 | 1209 | 1385 |
| 20 | 1226 | 1378 |
| 25 | 1352 | 1469 |
| 35 | 1349 | 1469 |

} 308 Run

| | | | | |
|-----|------|------|-----|-------|
| 25% | 1077 | 1/2 | Hot | } 350 |
| 35 | 1122 | 1338 | 662 | |
| | | 1360 | 704 | |

| | | | |
|----|------|------|---------|
| 25 | 1243 | 1/2 | new 1/2 |
| 35 | 1267 | 1445 | " |
| | | 1437 | |

Cold

| | | | |
|----|------|------|------|
| 10 | 1293 | 1297 | 1250 |
| 15 | 1243 | 1230 | 1247 |
| 20 | 1275 | 1290 | 1310 |
| 25 | 1310 | 1320 | 1330 |
| 35 | 1343 | 1317 | 1333 |

Lots of M soaked in Cone
Cobalt Clt ~~new~~ 45 hours wa
Cold

| | | | |
|------|------|------|------|
| 1057 | 50 | 146 | 200 |
| 1020 | 1277 | 1393 | 1467 |
| | 1287 | 1393 | 1480 |

Comes up slow

| | |
|------|---|
| 6000 | O |
| 1490 | |
| 1367 | |

Dry only soaked about time

| | | |
|------|------|------|
| Cold | 50 | 200 |
| 1263 | 1367 | 1133 |
| 1257 | 1350 | 1193 |

| |
|------|
| 300 |
| 1273 |
| 1233 |

Another soaked Cone Colb - put on
hot plate then in Roth

| | | | |
|----------|------|------|------|
| Edw 7002 | Cold | 50 | 100 |
| 7021 | 943 | 1200 | 1317 |
| | 947 | 1190 | 1260 |

| | |
|------|----|
| 150 | Co |
| 1427 | |
| 1353 | |

1% Silver Ox prep by Golden -
 Mod. Coed 50 100
 LW 7440 1093 1283 1350
 7408 1117 1243 1353

250 350 1/2 Hot
 1417 1317 1463 723
 1400 1310 1396 700

7a - see 2736 7a book 2500 to 2550
 about 1/2 7a 1/2 7b

By mistake 350 Test cells
 were reversed on 450th run
 + the Capacity was greatly
 increased + this means
 Capacity held for 200
 more runs test

359 } increased to 373
 360
 361

Remarks found in a
 concerning W. Island for efficiency
 tests

Same book find a remark

" LiOH 2 gms to 175 cc 21% good
 on wet test,

Same as above with 5 to 8
 gms K₂CO₃ added to better

K₂Stearate sol in 21 K₂ test of
 saturated with LiOH very
 little K₂Stearate dissolves

72. Req. mix 3 gms dried 212°

lost $\frac{3}{10}$ of $1\frac{1}{2}$

This sample stand was saturated with moisture absorbed as follows:

| | |
|--------|--------|
| 15 min | 6 milg |
| 30 | 8 |
| 45 | 9 |
| 75 | 11 |
| 105 | 14 |
| 135 | 14 |
| 225 | 14 |
| 315 | 17 |

(Both Cobalt & Uranous hydroxide and Ni increasing life & capacity - Neither are reduced by Fe so Iron will probably not be affected. This is not true if Fe is in the Ag .

A Ni profile charged against a platinum strip gives 750 to Volt & 900 to 3 Volt only gives 375 @ 400 to V when placed close to an Iron. Each probably the free H from overcharge of the iron passes thru holes & reduces the NiO_2 continuously & prevent charge fully.

Note if this is true, that any wheel circulation requires more rapid should increase this effect. Also, Ag having such small electrode should have big circulation, perhaps that's reason we lose 8% or against short test tube cells & it may be trouble with Fe in the big cells.

If all this is true should have a paper sep between Ni & Fe to keep gases from contact, - Can improve by using Ni & Fe sep & use porous cups then assemble & discharging.

Profile Nickel

I say if a 1200 iron fully charged is placed with a nickel discharging then on charging for only 200 MAH with 100 MA flowing - The nickel will increase that amount of chg. The energy loss on Fe will be great but should be small on the Ni. Now on discharging we should get nearly 200 MAH because Fe has great capacity. Yet we only get 100 MAH. (gas from Fe in the Ni sh?)

| | |
|-------------------------|---------------|
| Ni_2O_3 | 40.67% Oxygen |
| NiO | 54.23% " |

13.56% of Oxygen Capacity

7 grams Nickel going from
 Ni_2O_3 to NiO_2 should
 give 3000 mAlt -
 Ni_2O_3 Anhydrous

KOH 21%.

Tube fully charged quickly rinsed in water.
 0.357 KOH
 When discharged 0.512
 Difference 0.155

NaOH 15%.

Tube charged 0.267 NaOH
 " Discharged 0.499 "

Df 142.

| | 2 hours | 3 hours | 4 | 5 | 6 | 7 |
|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|
| 21 KOH 2 L. sol | 391 391 398 | 561 562 575 | 641 643 711 | 797 798 822 | 890 893 917 | 937 937 960 |
| 17 KOH 2 L. sol | 370 373 372 | 540 542 541 | 638 643 687 | 778 785 786 | 862 867 872 | 910 908 938 |
| 13 KOH 2 L. sol | 358 355 340 | 493 485 475 | 650 645 622 | 783 736 715 | 836 825 797 | 892 878 857 |
| 21 NaOH 2 L. | 393 386 392 | 575 563 570 | 738 720 735 | 841 821 841 | 942 920 937 | 976 972 980 |
| 17 NaOH 2 L. | 375 384 390 | 555 573 574 | 708 742 750 | 817 841 845 | 910 960 970 | 952 1005 1015 |
| 13 NaOH 2 L. | 381 381 382 | 567 566 568 | 730 731 741 | 840 842 857 | 935 940 950 | 970 982 985 |
| 21 KOH 2 L. | 393 | 566 | 698 | 806 | 900 | 945 |
| 17 " " | 375 | 541 | 682 | 783 | 867 | 919 |
| 13 " " | 351 | 482 | 639 | 732 | 817 | 869 |
| 21 NaOH 2 L. | 390 | 569 | 731 | 833 | 933 | 976 |
| 17 " " | 384 | 567 | 733 | 848 | 947 | 991 |
| 13 " " | 381 | 567 | 734 | 846 | 942 | 979 |

Outage

| | Volt effcy | Amp effcy | Watt effcy | Volt effcy | Amp effcy | Watt effcy |
|-----------------|---------------|--------------|---------------|---------------|--------------|---------------|
| 21 KOH 2 L. | 72 | 79.7 | 57.4 | | | |
| | 72.8 | 79.8 | 58.1 | | | |
| | 72.9 | 82.2 | 60.0 | 72.6 | 80.57 | 58.5 |
| 17 KOH 2 L. | 72.2 | 77.8 | 56.1 | | | |
| | 72.2 | 78.5 | 56.6 | | | |
| | 72.2 | 78.6 | 56.7 | 72.2 | 78.3 | 56.5 |
| 13 KOH 2 L. | 71.1 | 74.6 | 53 | | | |
| | 71.1 | 73.6 | 52.3 | | | |
| | 71.1 | 71.6 | 50.9 | 71.1 | 73.3 | 52.1 |
| 21 NaOH 2 L. | 69 | 84.1 | 58 | | | |
| | 68.2 | 82.1 | 57.6 | | | |
| | 68.6 | 84.1 | 57.6 | 68.6 | 83.4 | 57.2 |
| 17 NaOH 2 L. | 70.5 | 81.7 | 57.6 | | | |
| | 70 | 86.1 | 60.3 | | | |
| | 70.3 | 86.5 | 60.8 | 70.3 | 84.8 | 59.6 |
| 13 NaOH 2 L. | 71 | 84 | 59.6 | | | |
| | 71 | 84.2 | 59.8 | | | |
| | 71 | 85.7 | 60.8 | 71 | 84.6 | 60.1 |

Old book Jno 9375 -

18 groups 3 to group of Nickel
in small tubes with a willow
Lithia, shows on 50 Hot ramp
that 21K 2 L gives average 422
on Hot

But Dups with 21K no L
only average Hot 156.

Showing great capacity

yet 50 Ry capacity was with
Lith about 100 Watt more
than without -

The Lith, Canas Cell to take
give a greater charge when
hot, 2.7 times more

Why

Because with high
289 watt
& internal only
21 low
perhaps

93.75 old book

Notice that difference between

50th Run Cap. to $V + \frac{1}{2} V$

there was a difference between
Cap at $1V + \frac{1}{2} V$

of only 42.8 Malt when
no LiOH was used 21K

but when 21K 2 Li used

the def was 115.6 Malt

15 groups 3 each used to

get averages —

Why

Can it be that, Lithium

works on the iron

instead of nickel as
always supposed

average 15 groups 3 each

The Capacity to V on 50th Run

was for 21K 2 Li 1165

for 21K NO LiOH 1186 — S

In this case all the LiOH
did was to increase the
Hot capacity + $\frac{1}{2}$ Cap

Why

Something dirty
& variable

Important test -

5921 Nif group giving 1247 Cold
was charged Cold.
then heated to 132 for 24 hours &
then discharged Cold gave

| | 1V | 1/2 | |
|----------|------|------|-------------|
| 24 Hours | 1022 | 1072 | 93 mid hour |
| 48 " | 617 | 1037 | 126 " |
| 72 " | 311 | 961 | 126 " |
| 96 " | 203 | 908 | 4.1 " |

10 mAh lost per hour

| Group | 5909 | Cobalt Flake | | |
|------------|--------|--------------|----------|-------------|
| Chgd Cold | dischg | Hot | Chgd Hot | dischg Cold |
| 5.40 gress | 1V | 1/2 | 1V | 1/2 |
| | 741 | 786 | 452 | 495 |
| 1160 Cold | 756 | 789 | 475 | 512 |
| | 777 | 810 | 487 | 532 |

Nickel flake group

| Chgd Cold | dischg | Hot | Chgd Hot | Dis Cold |
|------------|--------|-----|----------|----------|
| 5.01 gress | 1V | 1/2 | 1V | 1/2 |
| | 993 | 999 | 632 | 642 |
| 1245 Cold | 975 | 987 | 630 | 647 |
| | 972 | 984 | 625 | 636 |

#6023 Anhydrous Cerium Potassium
Sulphate - stuff all come out

#9604-5 Manganic oxide
Reduced by Hydrogen

| Lot | 9.480 | Cold | 50 | 1/2 | Hot |
|-----|-------|------|-----|-----|-----|
| | 9.562 | 27 | 100 | 103 | 67 |
| | | 23 | 90 | 97 | 100 |

Swollen & splits.

#9606-7 Anhydrous Tungstic
acid reduced by Hydrogen

| Lot | 25.463 | Cold | 50 | 1/2 | Hot |
|-----|--------|------|-----|-----|-----|
| | 25.812 | 33 | 150 | 160 | 157 |
| | | 37 | 163 | 170 | 167 |

Anhydrous Thymox - Lot 8402 -

| #9446 | Cold | 50 | 1/2 | Hot |
|-------|------|----|-----|-----|
| | 13 | 27 | 33 | 33 |

Cerichydrox Lot 6550

| #9475 | Cold | 50 | 1/2 | Hot |
|-------|------|----|-----|-----|
| | 6530 | 3 | 17 | 33 |
| | | 3 | 7 | 11 |

Molybdenic acid reduced by Hydrogen

| #9469-70 | Lot | 14710 | Cold | 50 | 1/2 | Hot |
|----------|-----|-------|------|----|-----|-----|
| | | 14880 | 70 | 53 | 57 | 60 |
| | | | 67 | 67 | 70 | 60 |

Anhydrous Cobalt Peroxide
 # 9471-2 lot 10230
 10240
 Cold 50 1/2 H 25 1/2 H
 90 167 250 217 297 307 263
 90 173 257 217 300 320 240

180 1/2 H
 330 425 310
 337 537 310

Run as mono 600 1/2
 600 1340-
 1365-
 150 1/2
 685 1310 200 1/2 lot
 675 1355 605 1414 525
 600 1420 500

9473-4 - lot 1745
 17380

Anhydrous Uranium Dioxide
 Cold 50 1/2 H
 17 0 33 17
 10 0 33 17

Anhydrous Chromic Oxide reduced by H₂ # 9475-6
 lot 9500 Cold 50 1/2 A
 9524 63 23 27 50
 63 27 30 50

9477 - Anhydrous Neodymium Oxide
 flakes in the air lot 18950
 Cold 3 Buzel, bad swollen

9401 Thorium Oxide Anhydrous
 17693 Cold 50 1/2 H
 Processed 17407 13 70 57
 93 127 83

Lanthanum hexafluoride Anhydrous lot 8028
 Processed Cold 50 1/2 H
 23 47 53 67

Ce₂O₃ Anhydrous 9405-6 lot 7521
 7604
 Cold 50 1/2 H
 7 23 27 20
 7 17 20 0

Uranium hydroxide lot 10340
 10373
 # 9407 Cold 50 1/2 H
 10 17 20 17
 10 33 37 30

Cr_2O_3 Analy Wt 7690 # 9409-10

| | | | |
|-------|-----|---------------|---|
| | | | |
| Calcd | 50 | $\frac{1}{2}$ | H |
| 3 | 0 | 0 | 7 |
| | 1.5 | 0 | 7 |

8797-8 = Uranium Hydrox 75 parts
 Nickel Hydrox 25 parts
 Wt 9670-9700 -

| | | | |
|-------|-----|---------------|-----|
| Calcd | 50 | $\frac{1}{2}$ | H |
| 153 | 323 | 330 | 210 |
| 147 | 327 | 333 | 210 |

8799-8800 Uranium Hydrox 75 pts
 Potassium Hydrox 25

| | | | |
|-------|----|---------------|----|
| Calcd | 50 | $\frac{1}{2}$ | H |
| 3 | 87 | 110 | 37 |
| 3 | 87 | 110 | 37 |

Wt 11515 =
 11805

Nickel Meta Vanadate # 8793-4 Wt 6155

| | | | |
|-------|-----|---------------|-----|
| Calcd | 50 | $\frac{1}{2}$ | H |
| 197 | 107 | 110 | 137 |
| 197 | 103 | 110 | 133 |

Uranium Hydrox 75 pts Cobalt Hydrox 25 parts # 8803-4

| | | | |
|-------|----|---------------|----|
| Calcd | 50 | $\frac{1}{2}$ | H |
| 60 | 90 | 110 | 93 |
| 53 | 67 | 90 | 97 |

Uranium Hydrox 00
 Thallium Sulfide 00
 Iron Vanadate 00
 Tungsten Bronze 00

NiO₂ from precip Nickel Oxalate NG
 " " Nickel phosphate NG
 does Load + press Capacity
 750 to 50th Run

8929 - $\text{NiO} \cdot \frac{1}{2} \text{H}_2\text{O}$ pp from Nickel Borate
wt 7320 Capacity about 1130
7257

from Nitrate Cap 1067 wt 6024
" Animate " 1070 wt 6920

Caphos
Baphos
Sr phos
Ca Carbonate
Ba "
Sr "
Ca Borate
Ba "
Sr "

used with Michel
flake like req ni

all give capacity
less than
30 max

NaOH. 2 LiOH -

| | Cal | 50 | 100 | 150 | 200 | 250 | 300 |
|----|------|------|------|------|------|-----|-----|
| 27 | 1070 | 670 | 491 | | | | |
| 25 | 990 | 841 | 689 | | | | |
| 23 | 1286 | 1028 | 822 | 540 | 343 | | |
| 21 | 1257 | 1264 | 1090 | 792 | 553 | | |
| 19 | 1267 | 1307 | 1261 | 1062 | 707 | | |
| 17 | 1250 | 1255 | 1285 | 1117 | 868 | | |
| 15 | 1209 | 1244 | 1204 | 1202 | 1030 | 978 | |
| 13 | 1219 | 1190 | 1117 | 1073 | 949 | 826 | |
| 11 | 1193 | 1123 | 1023 | 959 | 819 | 718 | |
| 9 | 1184 | 1106 | 970 | 919 | 827 | | |

KOH 2 LiOH.

| | | | | | | | |
|----|------|------|------|------|------|------|------|
| 27 | 1337 | 1362 | 1367 | 1360 | 1144 | 1193 | 1051 |
| 25 | 1316 | 1316 | 1356 | 1079 | 965 | 1232 | 1142 |
| 23 | 1239 | 1275 | 1316 | 1295 | 853 | 1221 | 1134 |
| 21 | 1190 | 1222 | 1220 | 1045 | — | 1010 | 1038 |
| 19 | 1175 | 1212 | 1182 | 1053 | — | 942 | |
| 17 | 1157 | 1183 | 1090 | 992 | 893 | 714 | |
| 15 | 1153 | 1139 | 1021 | 844 | 800 | 621 | |
| 13 | 1174 | 1161 | 1026 | 771 | 766 | 655 | |
| 11 | 1159 | 1129 | 1016 | 764 | 665 | 510 | |
| 9 | 1116 | 1108 | 999 | 652 | 467 | 476 | |

15% 2 Li for NaOH
25% 2 Li for KOH.

first from this

$$\begin{array}{r} 2 \overline{) 1262} \\ \underline{631} \end{array}$$

$$\begin{array}{r} 2 \overline{) 637} \\ \underline{318} \end{array}$$

$$\begin{array}{r} 2 \overline{) 649} \\ \underline{324} \end{array}$$

$$\begin{array}{r} 187 \\ 237 \\ \hline 2 \overline{) 424} \\ \underline{212} \end{array}$$

$$\begin{array}{r} 2 \overline{) 949} \\ \underline{474} \end{array}$$

$$\begin{array}{r} 2 \overline{) 637} \\ \underline{318} \end{array}$$

$$\begin{array}{r} 2 \overline{) 949} \\ \underline{474} \end{array}$$

$$\begin{array}{r} 14500 \\ - 5800 \\ \hline \end{array}$$

$$\begin{array}{r} 1450 \\ 2036 \\ \hline 2036 \\ \hline 1624 \end{array}$$

$$\begin{array}{r} 2038 \\ 165 \\ \hline 187300 \\ 187000 \\ \hline 300 \\ 187000 \\ \hline 187300 \\ 187000 \\ \hline 300 \end{array}$$

1500400
1600000

2150d

$$\begin{array}{r} 2 \overline{) 350} \\ \underline{140} \\ 210 \\ \underline{140} \\ 70 \\ \underline{70} \\ 0 \end{array}$$

1720
18

~~2167~~

$\frac{2240}{1896} = 1.18$

1936
120
38600
19300
231600

200- 150-

$$\begin{array}{r} 172 \\ 3 \overline{) 516} \\ \underline{51} \\ 6 \end{array}$$

$$\begin{array}{r} 1720 \\ 134 \\ \hline 1583 \end{array}$$

$$\begin{array}{r} 1580 \\ 126640 \\ \hline 158340 \end{array}$$

$$\begin{array}{r} 284940 \\ 284940 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 240 \\ 211 \\ \hline 294 \end{array} \quad \begin{array}{r} 3/1590 \\ 794 \end{array}$$

28

no
}

Zw

$$I_2$$
$$\begin{array}{r} 14 \\ 40 \\ \hline 56 \end{array}$$
$$\begin{array}{r} 5000 \overline{) 34000} \quad (160 \\ \underline{30000} \\ 4000 \\ \underline{4000} \\ 0000 \end{array}$$
$$Z_n -$$
 $\frac{1}{2}$

$$\begin{array}{r} 0.1260 \\ \times 40 \\ \hline 5040 \end{array}$$

des Zentrums,

on chgs Zn would not
heat Ni -

$$\begin{array}{r} 1260 \\ 504 \\ \hline 1764 \\ 1720 \\ \hline 3528 \\ 1764 \\ \hline 2112 \end{array}$$

$$\begin{array}{r} 1433 \\ 40 \\ \hline 5732 \end{array}$$

$$\begin{array}{r} 1433 \\ 573 \\ \hline 2006 \\ 12 \\ \hline 2018 \\ 2457 \\ \hline \end{array}$$

[ITEM(S) FOUND IN BOOK]

FEB 24 1910

In re. Exp. #1752-H.

Mrs. Edison: You wrote me last week about trying a small cell with an Fe pocket short-circuited to a Zn tube as the positive electrode and the same for the negative electrode. I had 3 cells made of new tubes and Fe's, positioned in glass jars like sketch - p.d.
Filled these with 21 g. KOH + 11.2 g. SiOH per l. and ran as regular tube cells with following results:

| RUN | CELL A | | CELL B | | CELL C | | AVERAGE |
|-----|--------|------|--------|------|--------|------|---------|
| | 1V | 5V | 1V | 5V | 1V | 5V | |
| 1 | 963 | 1147 | 963 | 1147 | 993 | 1160 | 970 |
| 2 | 1147 | 1317 | 1133 | 1310 | 1127 | 1293 | 1136 |
| 3 | 1160 | 1310 | 1150 | 1317 | 1147 | 1300 | 1159 |
| 4 | 917 | 1033 | 943 | 967 | 920 | 1033 | 993 |
| 5 | 1110 | 1277 | 1110 | 1277 | 1110 | 1237 | 1110 |
| 6 | 1120 | 1290 | 1117 | 1293 | 1097 | 1233 | 1111 |

Voltage averaged 1.116 on these tests.

The volt curve did not drop straight down from 1V to 5V but had a tail, showing, I think, that the Fe gave out first because it did not get fully charged. The tube which is in front of the Fe would naturally shut some of the charging current.

Will now try these for holding their charge and then will reverse

the polarity and see what happens. W. E. H.

[ITEM(S) FOUND IN BOOK]

5.13 July to 1 Mar

513513 / 760000 (1480)

1192 / 6122 / 513
5960
1620
1240
1440

[ITEM(S) FOUND IN BOOK]

KOH

| | Col | 50 | 100 | 150 |
|----|------|-----|-----|-----|
| 33 | 1123 | 718 | 639 | 550 |
| 31 | 1095 | 641 | 670 | 583 |
| 29 | 1075 | 820 | 766 | 720 |
| 27 | 1032 | 844 | 840 | 826 |
| 25 | 1012 | 905 | 909 | 908 |
| 23 | 986 | 899 | 917 | 922 |
| 21 | 975 | 904 | 927 | 932 |
| 19 | 959 | 933 | 946 | 973 |
| 17 | 934 | 931 | 942 | 968 |
| 15 | 899 | 915 | 939 | 960 |
| 13 | 869 | 881 | 914 | 930 |
| 11 | 828 | 855 | 882 | 889 |
| 9 | 753 | 812 | 801 | 825 |

NaOH

| | | | |
|----|------|------|-----|
| 29 | 901 | 855 | 712 |
| 27 | 1058 | 998 | 803 |
| 25 | 1132 | 992 | 843 |
| 23 | 1080 | 1015 | 907 |
| 21 | 1047 | 993 | 905 |
| 19 | 1007 | 905 | 856 |
| 17 | 982 | 907 | 887 |
| 15 | 944 | 907 | 887 |
| 13 | 902 | 903 | 903 |
| 11 | 870 | 914 | 900 |
| 9 | 816 | 871 | 862 |
| 7 | 794 | 829 | 798 |

[ITEM(S) FOUND IN BOOK]

7291- 1247

1/2 Co ~~strong~~ - Bird open box 30 days (40) 50 100
 2.50 300 450 500
 1228- 1247 1212 1000 - chud (was changed) and
 Low cut 7360-

Strong Rada - Bird box 1 hole 30 days 7816-
 Made with 520 g. Rada, 1 hole in box 30 days 7016

Co 504 - 50 soaked green 150 200 300 350
 3/4 Co 1225 1241 1367 1117
 5/6 Co 1275 1207 1373 1162
 7/8 Co 1343 1290 1342 1213
 10 1347 1273 1367 1320 1250 1153 1240
 15 1300 1245 1350 1343 1350 1237
 20 1347 1347 1313 1309 1307 1153
 25 1347 1410 1410 1367 1407 1257 1250
 30 1410 1311 1347 1440 1343 1257 1100
 1257

Every 5% add 50 Run

Looking not same no needles what for
 just next sheet

[ITEM(S) FOUND IN BOOK]

~~Net 1.500 - 10 hat~~
1117

3/6 Comproson 7193.

5 7193

7 7138

10 7175

15 7144

20 7220

25 7202

35 71170

Co makes 2 Wt less
= draws 9 quies &
united

Reg - 7.713 = 1153

1090 - 1133

" 7.740

7.835 1077 - 1060 -

7.937 1067 - 1120

Buy No 54 Buy No 44, found to make -

L Wt 6765 1177 - 1190 100 1077 - 1177

smaller orated in Col ^{case} - L Wt 7.060

" " " 7.000

1/2 Hat - good

Notebook Series -- Notebooks by Edison
Notebook, N-14-01-01.2

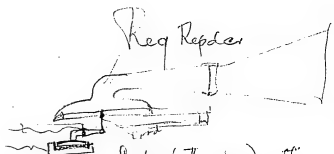
This notebook was used by Edison during the periods January-March 1914 and October 1916, partly at his West Orange laboratory and partly at his winter home in Fort Myers, Florida. The entries from 1914 pertain primarily to sound recording and amplification. Included are notes on modifications to musical instruments, phonograph horns, recording diaphragms, and reproducers, as well as notes on various chalk telephone and electromotograph devices to try in connection with recording. Also included are references to works by Herman von Helmholtz, Lord Rayleigh, John Tyndall, and other authorities on acoustics. One drawing involves studio arrangements for making kinetophone films and recordings. Another suggests making a hearing apparatus for the deaf. The entries from 1916 relate to Edison's research for the U.S. Navy during World War I. Included are notes that propose methods for detecting battleships and submarines, taking infrared photographs, and cooling machine guns. Other entries pertain to trench warfare, combating chemical warfare, bombs, air reconnaissance, inter-ship communication, and possible means for disabling submarine periscopes. The front cover is marked "Telephone Recording Navy." The pages are unnumbered. Approximately 135 pages have been used.

Jan 1 1914

Recording on Phonos
by interposing telephone
to other Expts on Phonos

Aug 1 1914

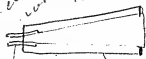
Reg Repda



Carbon buttons, faced with
lamp black, also electric fine fibers
buttons. fibers coated lamp
black

Jan 1 1914

Here is a sketch of a small tunnel
with a small opening
to the outside. The tunnel is made of
boards and is 10 ft long.



20 ft tunnel
10 ft long
1" board box
surrounding it

glass cylinder 10 ft high -
or neat cement. very fine & pumped
against a highly polished metal.

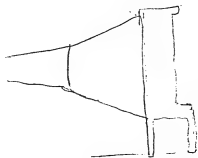


Note

2 ft x 4 ft
funnel

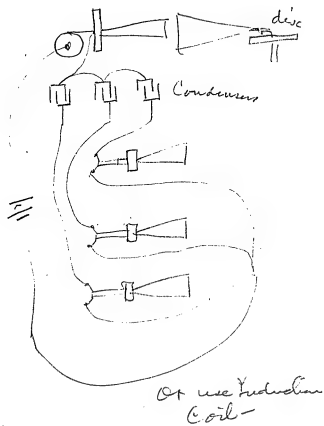
Note if long funnel
less sharp -

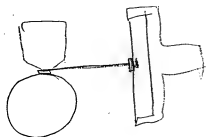
Jan 1 1914



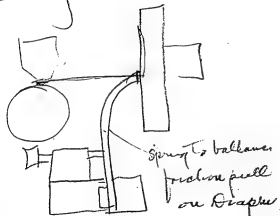
upright pine
funnel to cone
at back mount
of the board
a cross front

To prevent double
put 5/8 in hammer on
Reg hammer like
on loading machine
of wheel track -



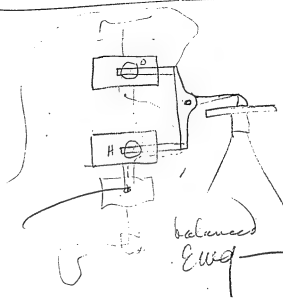
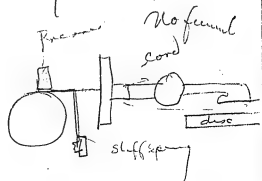


felt connection to
dia or equivalent to
string



spring to balance
friction pull
on diaphragm

July 1 1914



balanced
Ewig

$$\begin{array}{r} 4 \overline{) 72} - \\ \underline{18} - \end{array}$$

20

180 -

$$\begin{array}{r} 60 \overline{) 72} (12 \\ \underline{60} \\ 12 \end{array}$$

12 sec

$$\begin{array}{r} 60 \overline{) 72} (12 \\ \underline{60} \\ 12 \end{array}$$

1.2 sec heart

12 seconds breath

6 1/2 breath

July 1 1914

0

Can a flute be made
that will get rid of
air sounds at hole -
& be blown from compressed
air - use compressed air
& control air tube, or a slit by lips

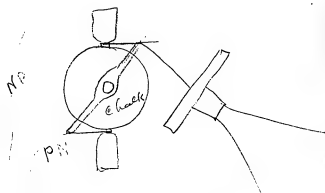
Humors is produced
by the unequal stretch
of vocal chords or
edges one 25%
other 25% - recall
3 beats - try equal
pressing throat on
a humors sound

Jan 1 1914

Funnel notes

| | | |
|-------------|--------|------|
| 64 V. 6 sec | | |
| 128 | 52.5 | 4.37 |
| 256 | 26.25 | 2.18 |
| 512 | 13.125 | 1.19 |
| 1024 | 6.562 | |
| 2048 | 3.281 | |
| 4096 | 1.64 | |
| 8192 | 0.82 | |
| | 0.41 | |

If a violin played
accompanied by a violin
1 octave higher or
even less (beats well
not so heard) they
cancel out 125 difference



possibly double
resistances will not
increase volume -

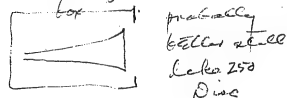
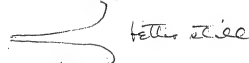
If so - they can connect

Multiple



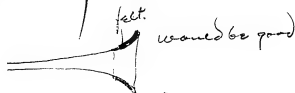
In funnels of all

Kind the sudden letting
out of wave at sharp
edge of funnel is bad -
a new ~~whirl~~ whirl is set
up - it tends to sharpen
waves & also to cause
the whirl to give an extra
wave to those in front



July 2 1914

Probably



This would let wass
pieces corners every
softly -



Probably

Velocity sound eqn of the lecture
only applies to outdoors
in closed hall where
constrained its directly
minus loss of heat &
friction —

To find natural tone
of a room, sound the
scale or equivalent.

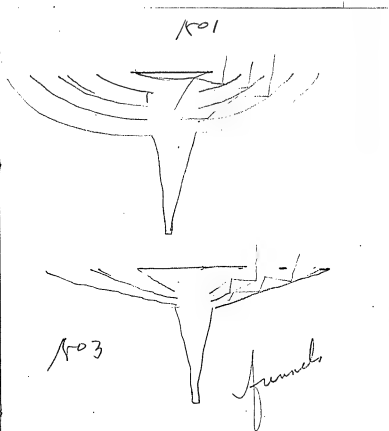
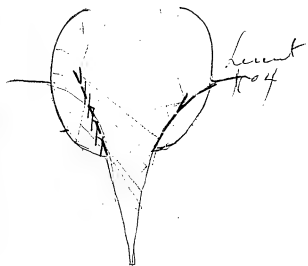
Recording room with
all appliances should
have their natural
note recorded

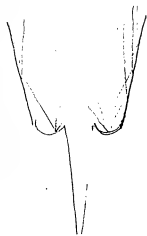
Raleigh say Vol II. p 68
ft note

I have underground passage
4 wide $6\frac{1}{2}$ high - by singing
right note to create vibration
I obtain free vibrations of
many seconds duration
and often happen the
resonant note is
affected with distinct
BEATS.

See Raleigh Vol II
page 102 Tunnels
Very powerful

Ratna says a hoop
Membrane is stretched on both sides
by sound waves as this
underwater ~~was~~ insensitive but
if its big enough for wave length
to form a shadow. its sensitive
perhaps our Dia recorder
should have a shield for
low notes -

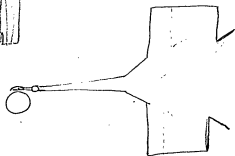




get glass funnels



small tubes before flare



Seven chemists Monaghan

Resonator of this is Middle C

over



pitch not
altered by
melting the
Resonator

It depends on
The Volume mainly
is melting doesn't change
the Volume

For substitutes for Cellulose
Substances -

Make Semihard rub -

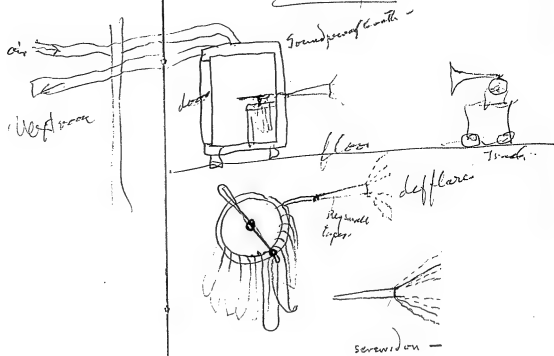
Pure Para - Sulphur +

Lead with pure

Paraffine -

+ Vaseline -

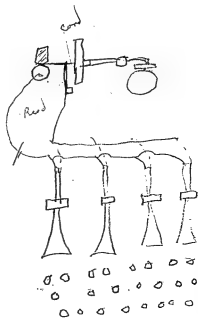
Heat recording funnel





In winding magnets
use the acetaldehyde wax insulation
to give less vibration —
or rather insulation, not better

Remember our old Lindholm
Coils. Spark depended on insulation.

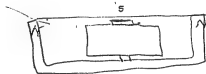


also series —
Remotes von
clamping

Electricity

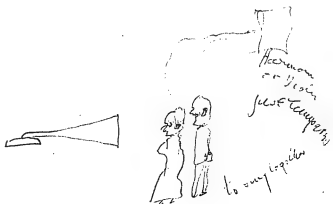
also Carbonous brass with

best & think



NOTE

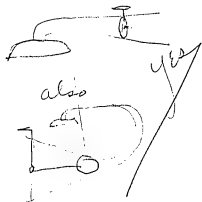
Diaphms fastened at
Edges, the sound box
must be same coef of
expansion to get even
results



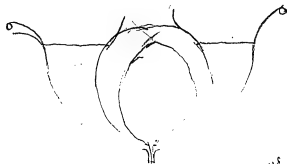
Diaphms with fixed Edges Alum or My Carlin

Cupric Cellulose
Infusible Condensate
Condensate Div. Vapour
Latex - same used def 6/4
Microcellulose - Cellulose
Viscon - Glu or Mica Solvent K
Electrolytic films Ni Fe Cu
Ag Al Zn Cd Sb
Diacetate Copper - Silk
Shellac - Japan paper - shellac
Gelatin - Cellulose
German Silver - Metals Large Dia

Did I patent /



Use Taper like small part Ring found



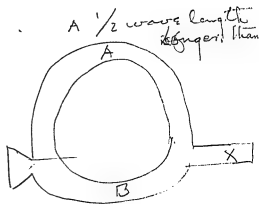
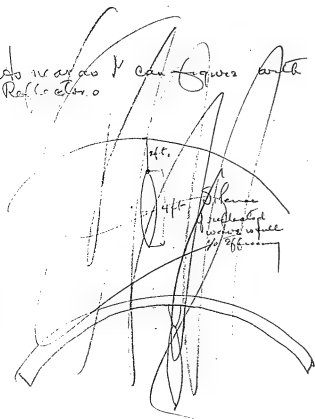
possibly only one



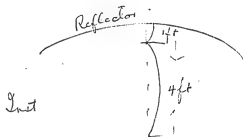
520/1000

350/1000

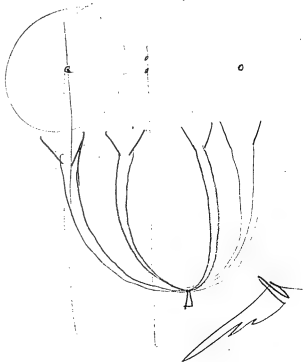
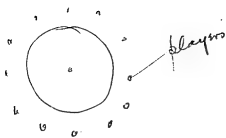
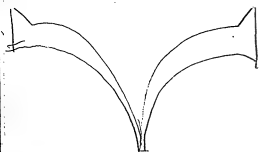
As waves & can figures with
Ref. to 2.0



No sound heard at X



9. - 2 + 4 or reflector from
distance 1/2 wave length
get Silence - 1/4 wave or less of 164 V/s



Try Cork dia fastened
at Edges, think can use it
 $\frac{1}{16}$ or $\frac{1}{32}$ thick & plug
holes with wax, etc -

Test Choudhary's Wax records

Get two past tests, then go over

all - pick out most attractive
over-purify all metals, filter
good + clean Turn + back for
smoothness then washes +
sweat with 100 (hand) +
Reproduce to get wear, Electrical
Qualities, sticky surface etc

Check Telephone

Look up in Hole book past
ideas on this subject

use Chloride Ca with Carbonate
Na as if get finer Carbonate
than by precipitation,

Get up good floating
Scheme to disintegrate
or Mixture of oxide +
get it in up + etc +
Clean —

Typed "Sound" p 9-

The strength of sound
depends upon the density
of the air in which
the sound is generated

hence in a steel chamber
under air pressure
we could get much
louder sound
Cold room best for recording

Thom



from

The sound wave is retarded
in thick part of balloon
hence slowed; produces
a focus -



Perhaps with the
wood ball in
\$250 Disc can produce
focus - larger ball
a Cotton

Try Sulphate Na &
Sulphate Magnesia Sulph
NaCl - probably get
Ox Mag Very fine

Oxides of Fe, Ni, Cd, Cu
S₂ Ed

Try Lithia Carbonate & only
use water on chalk

Or Mixtures of Sr & Li Carbonate
precipitated in solution or
by fusion



Perhaps K₂O dissolved
in glycerine will work
for wetting Eng chalk

Harmonics increase in power
in a piano the harder the felt.
with hard body the first
octave is 3 or 4 times
louder than the fundamental

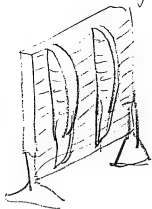
Synodal 122 pages

Get Lids or covers

Wheatstone in laboratory
Lots work on sound

The Chalk for Eng
probably used is
Aulicous. Insol
in water or KOH

for sound reflection
Use Cast glass -

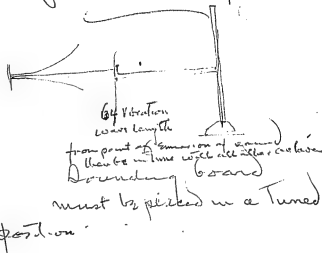


Etc -

Also - Sound boards
with felt shutters on face so
it can in 1 second be turned
into a reflecting board
to all absorbing no reflecting
board - a Continuous note
sounded with & without
shutter will show change

of quality consequently lead to results

Experiment with singing
the Violin playing the
Melody exact as singer
sings -
ditto & another student
say hard to play
diff - or Caccagnini



The outer Channel of the
Ear responds to
Notes of about

3000 per second

Dogs which know to
Music are particularly
sensitive to 3000 per
second -

Look out for it

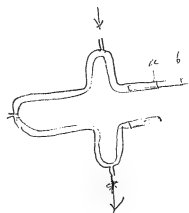
Perhaps its the
Tensor Tympani
not the Eardrum
or both -

Wheatstone says only
way to transmit from
a piano Sound Board
is to place ~~rod~~ ^{medium wire} rod behind
bridge, & wire should be
 $\frac{1}{10}$ " dia or fine rod
 $\frac{1}{2}$ to $\frac{5}{8}$ dia;

The way Wirth did it
was wrong -

Buy an old piano
50 to get the sound
board -

Make this -
Tynal 261 -

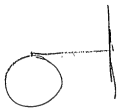


interfering
also can measure
across
lenses

see details

Send for horns
Catawba -
West 1/2 of 1/2 -
5/10/10

If we use hard Carbon in Transmitter
 with Disc replace it will have
 very little movement
 hence the Diaphragm may have to be
 made larger dia to exchange
 amplitude to power
 If 4" used with get 4 in
 the pressure & $\frac{1}{2}$ the amplitude
 but if lump black used perhaps
 present leverage & diaphragm
 will cushion

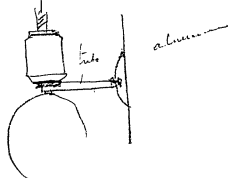


Think this should be
 tube to stop bending

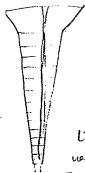


Should use a diamond tool to
 turn with very fine feed 2000
 to inch — for Chalks

Diaphragm should have a Center



Think Aluminum or thin steel
 or perhaps glass



Theory being
that funnel
will become
partially to way

Make funnel cut up in inch
lengths. Then put together so
opening between each section



folded
glue

imperfect column of
air + reinforce emptying

perhaps a lipid wound with
flat band do same thing



Leak where band
edges come -

Apparently should have
air tight joints in phous
work experience near
recorded as a leak
makes the long funnel -
at that point expansion
was small way to
the high notes, for distance
a leak 1/6 inch from the
diaphragm will rise once
the 4th overtone of Middle C
3 of C" 2nd of C" + 1st
overtone of 2048 C"

Hunt up 2 or 3 old
Enclosed Rubber
Chalk telephones
Used in England
for test of length
- fine chalks will
scream OK & operate

do elongating and break find SrCO_3 12 hours in hydrogen
34 hours in alcohol washing - handle that
if sponge used break test for 8 days

Try in moulding Chalks
to dampen with
Various liquids,

Water -
" a glycerine
" a KOH
" NaOH
" LiOH

Try making a chalk of
Mixtures of Ba & Ca
Carbonates -

In my old book I speak of
Tungstic acid as better for
Chalks than BaCO_3
takes lots KOH. I have now scratch
Say SrCO_3 twice as hard as
 BaCO_3 or WO_3 -

Run 2 gals on WO_3 &
Tungstic acid,

I found 200 atmos press on
 SrCO_3 best for the size
of cylinder used

I mention that on WO_3
cylinders permits use of
acids to wet. 55
This is big head.

Try WO_3 + CrO_3 Molybdates
& Chromates - with
acids - sulphates Borates
& phosphates the most in acids

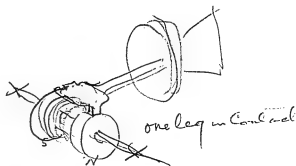
Try Arsenites & fluorides

Make long cylinders of metal
~~over~~ many of them
then coat with films,
Aceto + Nitrocellulose,
glues, fish glues, hogsmanth
& other. L. O. C. & for some
films - S. f. & H. K.
Agar, Agarose
Cellulose in L. C. & L. O. C.
Cellulose

metallic with $\frac{1}{3}$ wide
flat strip

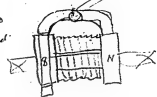


then count
steps of paper
between pen + this & makes
quick back of subtractions



Germanit mag

Magnetic Energy



Thanka Glad that made
it is me Glad to see

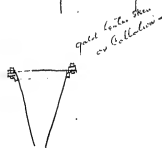
Emg - in theator
Use the old 5 1/2"
Dia use wood
& put it under
great tension like
a piano, to get it
Rapid - S

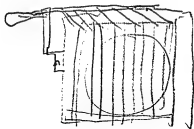
We always used big
Dia without tension
& they were dull &
flabby. When under
great tension they
are as quick as the
small ones

Get Reynaults Works on
Round of published
in English -
It has the stuff in
& accurate

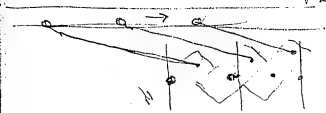
Says in the Contingent
Goldbeater Membrane
should be as close
as possible to the
more sensitive than without

This is Contrary to my Expts
Try it,

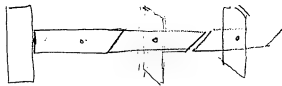
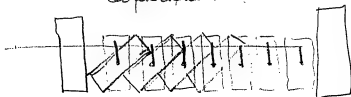




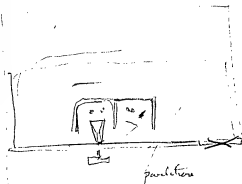
This can ^{be}
on separate stand
so not to
Link - disturb in
adjusting



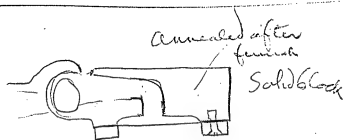
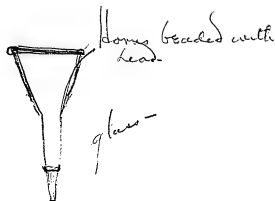
felt clamps shuttles for
modifying Volume of Opera
synchronization



4 so on felt about
 $\frac{1}{4}$ thick
Expt to the thickness



floor padded top
will partition
no vibration. Remove
off top aluminum
for hinges
& insulation



If aluminum damping used
Make box of aluminum
If steel use steel box

The Vic have no chatter marks -

Suppose we try after second
made in white wax to get a
ball exact size of second knife
say $\frac{1}{2}$ or $\frac{1}{4}$ smaller

Moment on resp. reduces weight
lightened to weight $\frac{1}{2}$ oz -
then add long spring on
to give pressure

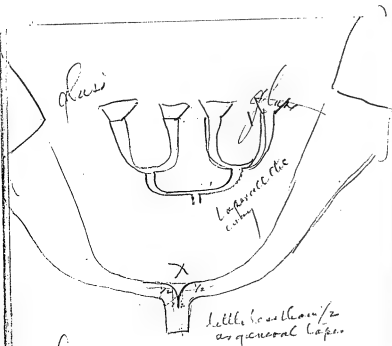
then start disc and run
it very slow say 2 ^{or even 1 revolution} Revolution
per min. this will polish down
Chatter marks & being
practically no weight or mass
but only spring pressure
& very slow it will not hurt
top waves

Try grinding an Urethra
Celluloid with Vicuna home

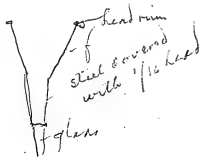
This is most practical
& can be done -

Try dipping Celluloid
Permet of Urethra &
Reg dip & remove -

also greatly ~~heavy~~
the Urethra Celluloid &
see of Chatter & Top
but ~~surf~~ & ~~no~~



Think this better than the other
as there is no expansion at X
to make a whine & lose power



In case it is found that glass
is best drop in it will be
necessary where fixed at E. slope
to make it longer in dia —
This will reduce amplitude
very much & only way is to
increase the knife holding
leverage. A glass box
would probably have to be
used or steel rollers
next to it in expansion —

glass 00089 nearest,
Cast Iron 00100

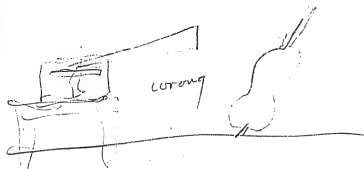
Steel box
Nickel sheet, etc

Wood has 1/2 the expansion
of even glass,
Perhaps paper & lead
with wood box

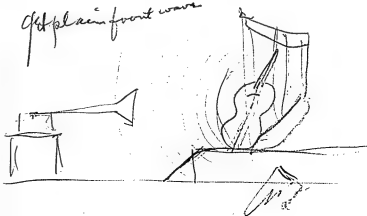
Porcelain less expansion
than anything — this is
possible for a box

As I get the EMG action
by rubbing finger over
X-ray tube, & also
finger over a metal -

Perhaps I can use porcelain
or other fine grain porous
material in the place of EMG
instead of platinum &
dilatograph alone can be
highly polished & it might
act -



get plain front wave



In doing the base & octaves
seems to be the trouble,
or high register is abnormally
loud,

It looks as if to raise volume
of low notes & diminish high
it wants a larger dia-
meter inertia than damping
the high " does not time in
I get full sound, bear this
in mind by feeling at
Edge & thick did it would
limit vibration for strong
slow - choppy high -

The 1st overtone is twice that of
fundamental - If fundamental is called
C then the 2 overtones will
be C'

2nd overtone is the fifth of
this octave or G' making
three times as many vibrations as
C

3rd overtone is the 2nd higher octave
or C'' making 4 times the
number of vibrations as C

4th overtone is major third of
the second higher octave
or E'' having 5 times as
many vibrations as C

5th overtone is the fifth
of the 2nd higher octave, or G''
making 6 times as many vibrations
as C & thus they go on

C C' G' C'' E'' G'' B^b'' B^c'' D'' E''

1 2 3 4 5 6 7 8 9 10



Arranged to funnel
outlet of each length -
with strong then rippling

in voice that this fundamental -

funnel for Corbalt's another
for De Kruis;



No good, takes too
long sustaining of the
tone to get strips up to ^{any} amplitude

Strip made of separate sheets -
Capable each of vibrating separately
stiffened & wound up to make a
funnel -
Some strip is in tone with every
note just intended of mass.
Not much good & gives

In above Connection only
air Column get roughly in
time as mass is small -

With a fork on resonant
box the Mass is so great
takes time if one is only
1 vibrator why its dead

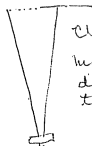
hence no hope for tuned funnels
 the except with air columns -
~~this is the case~~

Helmholtz page 67.
 Says a diaphragm connected to a
 bottle 6" ^{length} long - gives 1930 c/s
 rubber gives a certain fundamental
 sound (c/s) in tone with
 container sound. Sand being
 thrown to surface,

a 2nd candle showed .75 inch
 dia -

It may be we got some
 bad notes when the
 prisms tone of our dec
 is reached. What about up

Bent up dec is the best

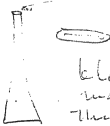


Changing more & more the
 mouth of the funnel
 deepens more & more the
 tone -

I think we could adjust
 all our music by an
 adjustment of aperture (also
 they use on a Cornet -

by this important

To find tone of funnel



gives no
 overtones
 at all -

these over
 tones
 thus given at

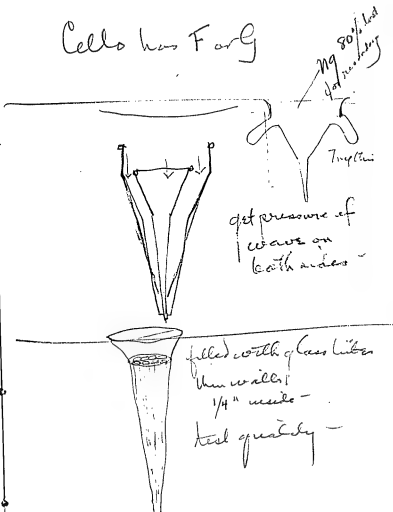
Helmholz dampens pears
 being 1/2 to 1 inch under
 with forest 1 inch has
 bristles - perhaps several
 inches in diameter when
 according to outside good

Should try extent of
 loading hammers of

Pears with sized the
 amount of lead necessary
 as we go lower pitch -
 to get more power out
 of low strings which
 are weak

Helmholz says all
 Vi olins - have note
 of their own in Round box
 General C.
 Walter Lockhart

Cello has Forg



perhaps when using a diaphragm
fastened at edges the
diaphragm should have greater
coef of expansion than box

then both heated to 150 fah
fastened. The contraction of
dia would be greater than box
so it would be drawn tight.
& we would not be troubled
by die getting off baby

It would be less sensitive
at 60 than 70 fahs
& thus in box of caliche
temp controlled to
get any disadvantages
we would,

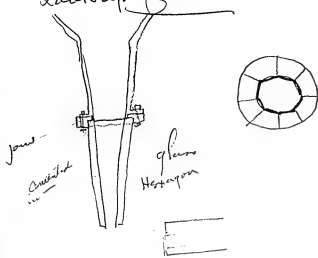
Cup or Diaphragm Material

| | Coef Expansion |
|-------------|----------------|
| Al Cast | .0022 |
| St Cryst | .0011 |
| Brass Cast | .0017 |
| Roller Iron | .0018 |
| Copper | .0015 |
| Brass | .0017 |
| Flint Glass | .0008 |
| Iron Wrot | .0011 |
| " Cast | .0010 |
| Mg | .0026 |
| Ni | .0012 |
| Pewter | .0020 |
| Porcelain | .0003 1/2 |
| Silver | .0019 |
| Slate | .0010 |
| Steel | .0011 1/2 |
| Zinc | .0025 |
| Zn & Sn | .0026 |
| Pine wood | .00049 |

Looks like Steel or porcelain
and Zn Mg or Hard Rubber
Ag

Speculum Metal —

3 part Copper 1 of Tin &
a little arsenic Very brittle,
probably good for end of
funnels and tubes very fine
plate etc. think its anisotropic
Look up further —



Possibly Hand
Possibly Coal tar pitch coated
with film dope having Camphor in
or not will deform under properly
regulated heat & cast as
substitute for Celluloid such material
possibly other plastics also

~~Shells melted with trichloro~~
~~substance very sensitive to heat~~
~~perhaps can work direct with 1/2~~
~~perhaps trichloro compound —~~

It is probable that the
reason the other part of
a disc record is not so
clean & good is the extra
friction on the knife due to
higher velocity & thus
weakens cross bonds,
& also of course to extra
scratches —

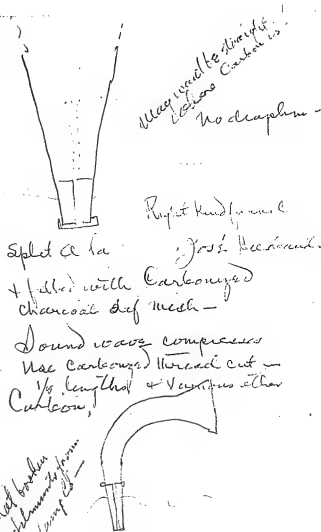
We should make so
expts on the friction
of a polished sapphire
on def. waxes
Easy done —

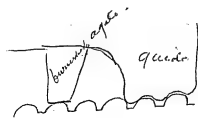
Another cause for loss of higher overtones is the pressure on the disc due to tracking.
With the advance call recorder the way that stresses the disc the least to give normal tracking will be the most sensitive —

This can also be easily tested using a recorder supported on knife only the old way & with constant speed as (1000) keep it going by making side wobble width —

Some of the Machine dys may be set in wax & make them more amorphous —
Ditto, a large number of wax

Make a test piece Stearic with ~~wax~~ as base





To burnish the Copper
or 2 blades



Area movement to the
burnish

brush of 2
1000 or 1000
has gone -

quite thick -

Take up the 100g Mand
gale with brass +
Copper - one brush
Rough or not,

1st theory of tremolo is unequal
tension of the 2 Vessel chords

2nd theory is vibration of the
jaws throwing the air into
vibration 1 to 5 times second.
If mod like C we get 256
Vibrations a sec a tremolo
of 2 per second. The jaw vibrates
twice second - altering the
resonant C with varying
Val - or altering the waves
into 128 times -

Hold the jaw of a tremolo singer +
see if it stops

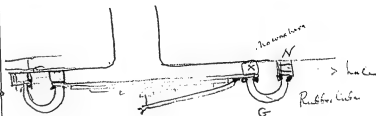
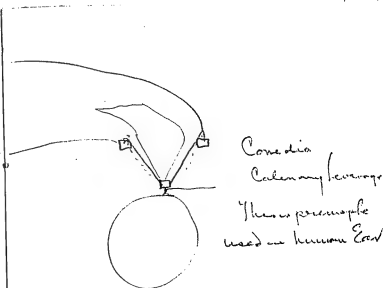
Try a song short & simple
sung with A then E then

1 O + U, note notes
that have tremolo in
each song of different
then I must be vibration
or oral cavity

Helmholtz says Ear is tuned to
notes between e''' & g'''
produce a feeling of pain
in some cases, if there is
any vibration which affects
this part of Ear its powerful

This is generally the case when
voice is strained & it gives
a screaming effect,

In powerful male voices
singing forte sounds
like tinkling of small
Bells



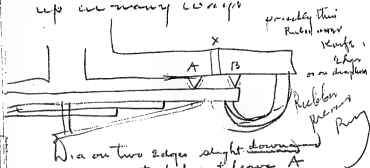
This kind of a valve moves readily
as a valve & about like a valve
It is held against a perfectly flat surface X
N is a ring on which other ring
G of a Rubber tube is seated; this ring
will hold in

OTB

On waves coming the diaphan grows
down as a cataphal & the president
against X makes a tent of
president the escaping and
preserving three hats in IV
hence its amplitude in
checked for high waves
but not for low —

The rubber & discs must be carefully made & measured in size.

This idea can be worked
up in many ways possibly



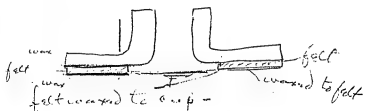
Dis on two edges slight ~~downward~~
movement of dis at leaves A
& is carried by B - this lets air
into chamber but A+B & forcing
out of holes X



When I ~~left~~ introduced
+ knife cutting a downward
movement gradually a large
clear opening, it is a small
groove around base of finger
more opens larger & more
as my thumb coming clear
hole open or closed

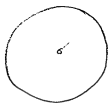


Am 1. Mai 1900




This makes a soft low lay
20 to 30% sink through
if felt $\frac{1}{2}$ " long -

die full len of cup -

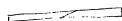


cut oblique by a razor
to center & used in die

Precision just good plans on this
with  split rubber like

This principle can be carried
out in many ways

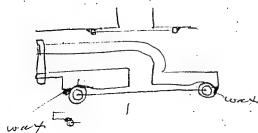


 oblique cut



built up of sections like this
paper - rubber etc.

W. Miller thinks good results
are only due to rubber &
not to split diaphragm

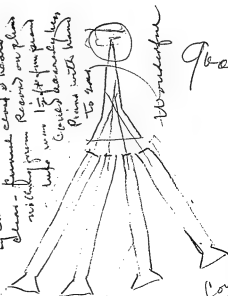


Reparate room

Sound is not
weathered

Shutter to Control
Vib. high notes
solid. high 1" thick against
board

Later, 10 ft square tubes
lined 1" Cowhau held in place
by clasp with leaving 1 ft gap
between clasp & board
then - finished clasp on plus
willing from Record on plus
tube was 12 ft from plus
Circles heavily lined
Print with tube
To show



Wonderful

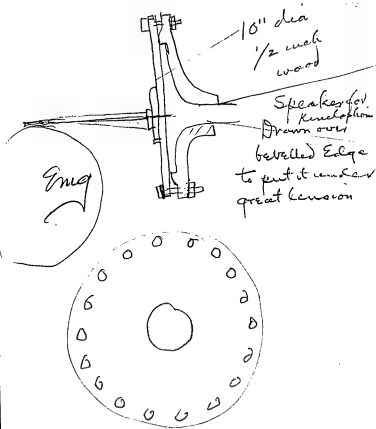
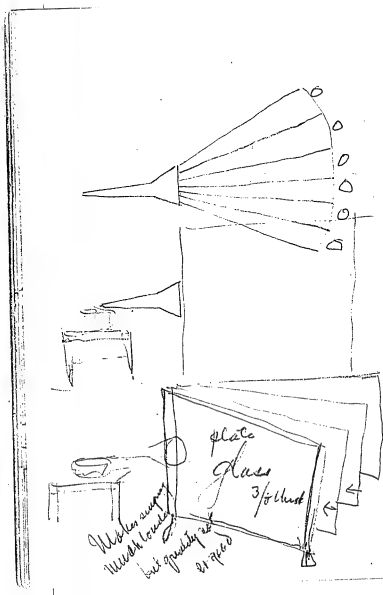
Good

played from one
end of the ground floor
wall to the other 10 ft
high on the whole with
projected on the whole
1000 ft 15 ft 15 ft 15 ft

This is a complete
feature 10 ft tube
less than 6"

6" pipes lined inside with
1 1/4 inch of Cowhau in bag
Cotton stop echo -

Try single tubes
6" inside of Cowhau lining

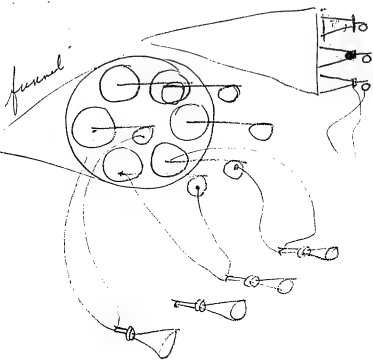


Also Octagonal
Cemented pieces

glass funnel
Triangular

3/8 thick Perspex plate
glass cemented -

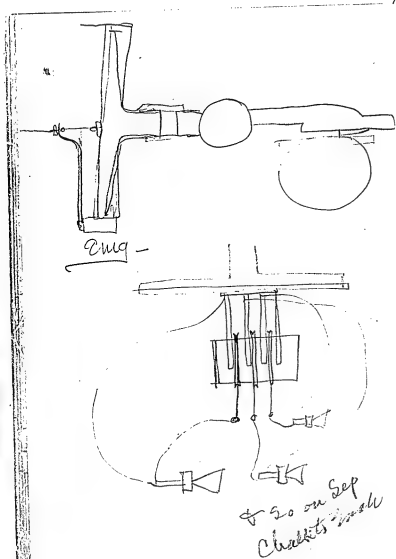
Now these recording for
funnels any gaps for
Volume all need floor
Cant say how quickly
is made floor



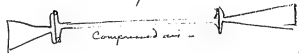
Bell Telephone

Each sample -
not -

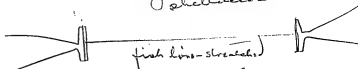
Eng - Reg Dia Mashed in
front of glass funnel



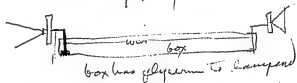
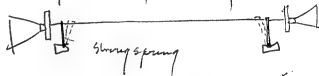
a 003 Cop or steel wire 10 ft long
is same as a Cubes $\frac{1}{10}$ of an
inch, this is not heavily loaded



Cat gut, driven thread
shelled -



as strong as possible
shelled thick so it is soaked in
shellac & quite hot all over outside
5/16 in thick, then waves shaped
travel by longitudinal vibrations
12 ft shelled be very light
weight, necessary shelled
very tight & durable

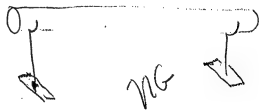


It looks as if nearly all of a sound wave is absorbed by a bag of Cowhairs such thick



Sound waves would not rebound from Cowhairs hence whole of the Energy should be absorbed in giving power to Dia —

In Recording rooms are Can be got in (16) Vibration then for 6 @ 10 ft 6x6 inches lined 0.5 inches




Try 6" tubes of Drawing Board paper or even thinner also Octagons with strips & so only sections of paper vibrates hence would be quick & not carry over 600 Sound - stop Bell V. Flus —



the same time with less makes my one number of vibrations from 1 1/2" diameter for 2000

It may be the reason we lose
Volume on low notes played
is their partitioning funnel at
less parts in time + give big
vibrations to launch off fingers
this degrades the Energy
The funnel should be closed
to low notes + everything
else in room - Piano top etc

Bel sound maybe due to
impact of sound waves
especially low ones +
possibly 10 ft long box will
ring + give bel sound when
30 glass tubes with drum mounds
together will not + val not
much themselves possibly
Piano tubes - the Bell
cabin  will diminish as
diameter diminishes even
120 1/2 bore glass might do
better

Possibly - Wind instruments
Could have connected
to them Cavities like the
human Cavities + thus
give more overtones +
change quality of
instrument favorably

Put strip Cork under
bridge of Violin -

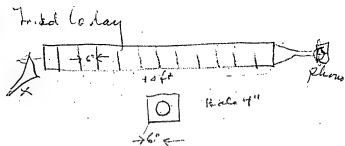
glass fibre bow for
Violin +
Artificial Silk string to
bow -

An Extra dead string
3rd thin steel - to overstrain
the Violin - + not used to
play on - Clearer resonance

Aluminum wires on
Violins = also Sigm
also the fibres from equines
they used for thread instruments

Paint strings with ^{steel} Condensed
Varnish a ^X hindew for
Violin —

Violin - strings double like
pens - steel strings -



With all in scarcely heard
anything, with the partitions
placed w/ f-holes 6" of them
no improvement but somewhat
louder without partitions
 $\frac{1}{2}$ the loudness with X f-hole
at end as it was with
X in front of f-hole

Noticed when No partitions
+ box lid open heard scarcely
any Bass everything sharp
no mellow or overtones
(when lid closed) it was
twice as loud + Bass
came right out loud + mellow
but higher notes thin
+ tingly -

Shows which are bad -
also 10" 6" wood box
cuts Violin down more
than $\frac{1}{2}$ = It didn't show
much barrel sound -
The whole trouble is
friction,



End piece -

56 in. p.p.

with thin Celluloid + 50 lbs
pressure in 10 ft tube 6" inside
Or can use 6 inch pipe -
Think if tube polished inside
be very little loss sound -

Tried today Feb 10. 1914

24 tubes brass 1 9/16 inside
diam 1/8 wall (about) 12 ft 6" long



The Volume when listening
with funnel was about
1/2 that when funnel was
in front of phono funnel

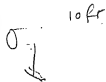
Very much louder than 6" box
with one or 2 sections in -
The Quality was OK, Phono
spoke in air gave 1/2 the strength
than as when he spoke in
funnel Voice sharp in air +
Mellow in funnel - apparently
Very little muffled + no echo
or after swell + about same
muffled as Humphreys talks
+ is more favorable for nurse
singing than otherwise
I catch first any vibration of
tubes + played a song
with a ~~recorder~~ it was
sweet + good no funnel sound

Think could go 15 @ 20 ft.

This probably be better with
glass tubes 1/8 wall -



1 funnel 4 section of tubes
or 2 funnels smaller
8 or 32 per funnel



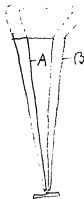
Tried drawing paper 6" dia

listened well funnel & it acts about same as box 6" but shade harder & thick its sharp & poor.

The 24 brass is mellow far superior for our purpose but only $\frac{1}{2}$ ~~thick~~ to $\frac{3}{4}$ the ~~thickness~~ but I think glass will increase volume —

H Myers March 15 1914

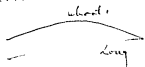
Interpose induction — EMG check kit if much internal movement in Carbon Contacts —



A funnel to record B
funnel closed at small end
The walls of A funnel are neutralized & should not vibrate producing B walls are strong

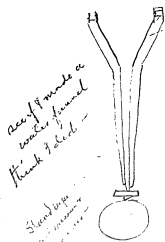
to get perfect neutralization
End of B should also have a simplification

I notice in explanatory talk articulation is better to me on last $\frac{1}{2}$ of second than first. Also the singing + music is better. This seems to show that overtones + humming notes are less audible on long note + first than short.



Also it is noticed that a washed blanket has a smooth surface with few snags. But when removed it is rough and lots of snags. This due either to vibrations given. The sound box itself by that wave flows or the displacement due to wave displacement irregularly or makes these rough surfaces. Irregular are not given when regular displacement takes place or no irregularities (nothing or wave chips).

It is noticed in the plotting + Rec technique of 1914 Jan to March that surface is smooth other first part of second then the last a reversed of all on with possibility.



double funnel filled with water or other fluid -

to stop movement of walls of funnel

I believe barrel round in these long wave tubes

It does is due to blow of sound waves

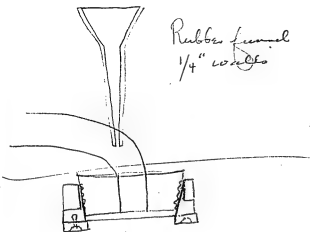
as waves in great flow, barrels are as sound has caused, also try



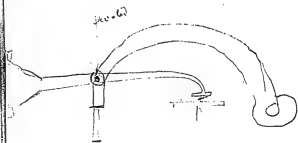
12 ft water level

acc if barrel sound

The bell around increases as diameter of tube increases - get very thick Shelby tubes 4" or 6" long it polished inside. $\frac{1}{2}$ to 1" walls of pipe - Also cast iron 1" thick - 2 ft long 12 ft polished inside, 4 or 5 inch walls



Taper used to spread holding ring where Dia featured at edges to overcome heat expansion by expansion the volume



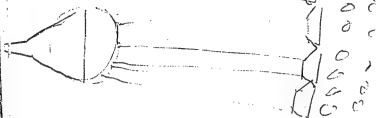
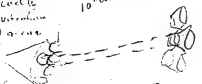
We should fix pens hammer to reduce volume high notes so low notes will be louder & give proper E.C. ratio

Bikarshock -

Evidently after vibration
by Boring sound is due
to tube walls - with
1 @ 1/2 gals; the vibration
too high to record on our

10 to 12 ft
1 1/2" glass tubes
10" wide by 10" high
Huskyballs

and not with
sound & with glass
very little new volume
large & small in

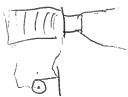


Electrolytic Telephone

Vary area



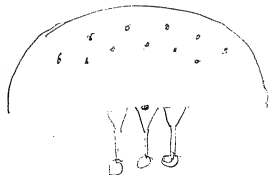
Direct or thru Coil -
Magneto or Zinc



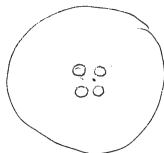
The colder the room temp for
 we condense the greater the
 Volume of air is more dense
 + more movement of a dia-
 goes stronger waves in a
 Vacuum there would be
 no sound waves with you.
 (2) ordinary Vene there might
 be with 1 inch movement

The paper the frame surface
 is as a conductor for heat
 the better the Conduction comes
 it receives heat as it is
 affected differently.
 Current is probably best
 wave on wall which would
 + heat fine ground current
 to appreciate a glowing
 surface -

Wood + Veneer like Music Machine
 Horn very good - test show
 its loudness of all the 42 funnels
 for recording - 9 ft away
 from a disc

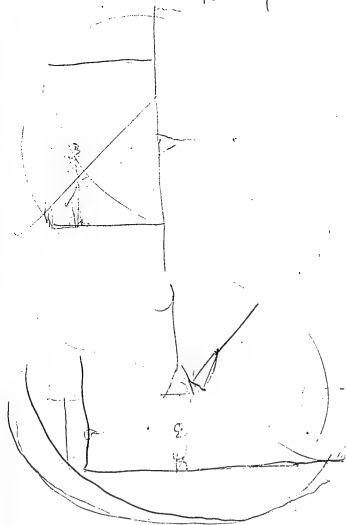


Think with the Reflector
 3 Records possibly 4-2 top
 2 below can be taken with same time -



it would be better as can have a
 man at each

Kinetophone—



1" Celluloid disc fastened at
Edges—



spring to bow disc upward so it
won't jump out when sensitively adjusted—
old style press at edges has no limit
+ must jump out of sensitive, Only
use spring so it bows it just enough
and flexes—

Perhaps if Knife holder fastened to
run snail to disc it could bow diaphragm
upwards enough to prevent jump out

also



strong



Can't jump out.

Films for Records with
Diaphan fastened around
Edges

Hyatts silk

Collodion

Acetylcellulose

Silk Cloth Collodion or shellac

Gold beater's skin

Fish bladder

Animal Membranes generally

Glass flow sheets blown by Dally

Rubber stretched to limit

Use Varnish Pens & Drying taken from

Plate hot or use Sesame oil -

Paper - plain Collodion or shellac

Mica

Mica 1/4 in. by Electrolytic

Sesame & Siphon Scales

Linum Collodion, gutta hot roller,

Shellac, etc.

If Animal porous Membrane
used in recording, fills pores
with gelling fish glue with glycerine
the sound will be softer & also
less or diminished Volume

When Diaphan is used strip it
of the Case & all parts that
will echo the sound waves
from other instruments
& in Reflector put it in
various positions to get best
effect.

Quartette Regalettes

Each singer has telephone
Ear pieces connected with
telephone, a clarionette plays
the melody. The leader who
has telephone cap gives the
time or rhythm all
singers sing to Clarionette
& Control look by it to get
no beats. No singer hears
any other singer -

About 19

Navy

Oct 25/16

(*)

Using Röntgen heat camera some hot areas
which of Breckinridge to act on a family
in a forest - On Thursday will make no telephone
becoming Government reformatted

Photography send out a beam of light
as powerful as possible from any one
with greatest amount of light (red).
Does 6000 Wm. Infrared light is absorbed
for visible light - Use very sensitive plate
with reflecting to cover to bring to a point
focus. Send the plate with frequency
or Control, that now known - a constant
Experiments to determine how in a direction
By for to help Infrared

Rock salt lens or Fluor Spar

at 1000 heat the waves go 92% through Rock salt
54 Silicon sulfur 33% Fluor Spar 20 other things
- Infrared light goes 32% - following process

Opaguerum to 160° radiant heat depends upon the thickness of opaque substance we made. Very little they may approach. Rock salt in transparency.

The water vapor in the atmosphere is going to be a big in working infra red at a distance. Low humidity will be favorable.

In machine guns after Charge
Explosives Explosive Carbons Solid CO_2
or liquid gas to Coal gun.
or water jacket Water fed with Solid
 CO_2 ~~water~~ Think most practical
is water cooling at machine gun cooling
thru a small but cooler if have even sodium
to both gun barrel. poly chd use
record power

It is probable that there are chemical reactions which always appear. Calard to see wheels of smoke in a suitable distance for light & radiant heat & low temp that they would not show a small fire. Each a fire in a suitable distance. Infrared & we could then photo in the dark or detect in ships at a great distance as in night blindness of night.

Think on night wheels we can see or only light of stars that an extra sensitive photo & telescope that ordinary light could be used to detect ships at distance.

Another scheme is to send out very powerful sound waves for sound below audibility. These waves strike ship & reflect back. Long cylinder is tuned to these waves & listening tubes used with a recording instrument to break up the waves into 256 per second or higher after they have passed.

Iodide (red) of Hg changes color with heat, turns yellow.

Infra is absorbed by water, hence aqueous glasses is practically opaque.
White rock salt, CS, Chloride of phosphorus passes infra freely

Detecting Mine gas

Take advantage of the greater absorption of 100% body Marsh gas for recedent

Heat than dry air -
Use thermic & bridge method -

Air (dry) absorbs 1 while Marsh gas 403 times more

Ammonia has 1195 -

But relative absorption above 1 inch is air 1 - Chlorine gas 6030,

Sulphurous acid gas 6480.

adding 2" does increase in proportion
as from 100 inch Marsh gas then 2"

The time elapsed between time waves sent out say a flash & the return gives the distance of the ship -

Smaller way is to use my aeroplane periscope containing a charge of magnesium powder & with a very powerful search gun send it the greatest distance possible. Explodes & light the powder - at same time on tip of search gun & telephotography lenses & select desirable big grain emission plates & photo with the search must heat the hydrogen -

Very high speed 40 miles sound travel. Could be sent out to 100 miles say 300 miles or more a distance could be used.

Think in clear nights by using only the photographic rays which are nearly invisible & not using a beam or if used use several beams to give general diffusion so enemy would not notice it that we can photograph a dreadnaught

at 5 or more miles if we use a
Special large grain sensitive plate.
perhaps a generally diffused blue
or green rays could be used.
+ Exposure of 1 minute or less.

Special fly paper or birdlime + paper
bits for springing ground on footrest
Delays -

Differs a Mechanical delays like a lot of
wheelbarrows operated from 2nd trench.

Try Experiment of how efficacious a 1 1/2"
Cow-horn pads over the ears is -
in Cannon work.

~~The~~ boomerange photostyl Camera

to go over enemy trenches +
sweep around back - may not
be hit or noticed - move
swift.

Electric boring Machine device for
boring to close by Grenada
explosion of Chlorine, etc.
The chlorine under pressure
when break down goes reaches in
many cylinders connected in
5" hole. It would strike the
deeper or rest sections -
a non-ferrous gas would be
better. Gas in explosive proportions
better pressure - only it would do
with 25 per mile somewhere.
Example: nitro-gas full of gas or water
with explosive gas. The ground
probably has a few or smacking
or an open light.

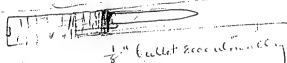
We could react by what I tell they
go on to the tank.

If ground proper could use double
pipe & center to make hole,

A large wheel 3 ft. dia.
to be filled with gas or
Kynamite, propelled by a device below
the ground & with Eccentric Motion
giving it a small oscillation
while the wheel rotates pendulantly
by bullets & moving to & fro
for guns or exploded rocks
or near trench,

Also an incline up which wheel
rolls & sent without motor but
Collapsable if trench not far
apart, unrolling a wire &
fired by percussion,

Short magazine
Trench apparatus



$\frac{1}{2}$ " bullet oscillating
fastened to disk

The disk would rotate while
bullet would rotate on the
eccentric axis & produce an
effect as larger bullet. There is
 $\frac{1}{2}$ doz times as much ammunition
could be carried.

Powerful are light in daytime
might be an aid to vision for
fizzling percussion -

A Bomb Many revolvers thrown
through many sections of the
ground in all kinds of directions
along the horizon in bright day
light might puzzle the percussive
man so he would be confused

If a beam struck his perspective
glass it would be reflected
back & reveal his position

Bomb - make it similar with
fine teeth - use an inclined board
teeth in the end facing the other
bomb - Hold bomb off a little
Saw Revolution Several times
or head heading Key drops it
on board shaft, up incline
& Collapsable over on the
inclined plane - the wheel
lighter & simpler than
proposed wheel

Photo plate may possibly be made
more sensitive by electric heat
inside camera to heat emulsion

possibly a 3 inch 500 telescope
pipe with guy wires & tripod
to hold and as possible - to
used.

Atropine propellor to go
to limiting vision from war
nerve on the night which
on lighting on water igniter
Magnesium powder to acetalum
Kochly of ships - also
Calcium Carbide & Caphors to ignite
it throwing many so vision
over wide horizon possible
as suggested in Spanish
Lives -

Try the Central Force telephone used again
also for inter-ship communication

ditto air compressor pipe system
of dispatch boxes - Central station

Inter-ship phone -

5 wire, water & wire independent
communication system in same wire

Don't know if this is possible
think they make porcelain lined
tubes -

A good Al Drake producer
is going to be handy -

ditto a tracer for projectiles -
simple -

Any battery used in a turret
should be in an explosion box

Why not correct the drop of a
gun by a tracer plate. This would
help determine a provision of
shooting -

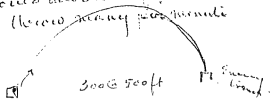
The lining of a gun after
boring should be mechanically
peened & then bored & rifled -

I am not sure but that it should
be hardened -

Try experiment by peening
out a tube, peened & rifled
hardened & not hardened -
this will give a rough idea

The electric force (or) necessity?
of the dynamo on war ship may be
a source of danger as a drop formed
or a fire in the water anywhere
may give spark - Try -

Having bombs tube with
 side pockets using gasoline -
 say 4 feet long keeping up
 the pressure during whole
 stroke probably Paladium &
 Naptha or Pat Bengue better
 or Kermene Benzal alcohol -
 piston used with tapered rod
 extending thru ending 1/2 inch
 with extension guide for bomb -
 Use compression to stop -
 Could have a self action on
 a third many more



The kind of trajectory
 should be pretty accurate
 pockets & angle control distance
 & trajectory -

Right angle or commencing branch
 should follow board or sheet iron
 bottom with slings & batter can & can
 to bring up many sections. Branch can
 go back with all shift - also bring
 up numerous & quick -
 a. Works good & probably
 grooves in boards to guide &

Motor truck should be
 designed to go over hills ploughed
 fields, stumps butt away
 fences & make good time & not
 depend on roads at all -
 going thru woods. A tree sawing
 truck should cut away the
 trees fall & remove leaving stumps
 say 1 1/2 or 2 ft & the big
 trucks should follow gathering
 of these stumps -

Cant see why Hypocrite & Co
 designers wont clear the air of
 Chlorine if every made has one or
 large tanks & ready - Kill it before branches
 branches -

Year producers can be taken care
of by local culture. Extremely
thin film set over system
sticking sticking plaster.

Li the Rack of Gibraltar to form
Venus why is not the Navisink
Mountain at Sandy Hook

With a harpoon gun throw a
lasso with 25 or even 100 ft
loop over a periscope with
a quick power driven section
to broken loop + draw to
pull off periscope.

As a whalehead torpedo
approaches the steamer
force hoops with various
diversion & diverting explosive
bombs to divert its course
or explode it.



two arms with fine wire (cable)
Cable carrying a heavy wire
plate under water, when
torpedo is seen work motor
to bring plate in its path
to explode it - say 25 ft from
boat. This can be guided gun.
than torpedoes can reach

Run up from the floating net a
pipe like water to low duty very
light as 150 ft beyond top -
outline put a periscope for
observation

at sea 50 or more miles out
lay small cables with
~~the~~ microphones strung along
every 500 ft + reaching on
bottom, say 600 to 1000 ft
deep - 20 miles each way
from end of a land cable
to a boat is 600 miles
long will require 15
stations, no float could
pass without to know a
number of ships at position
6000 miles

Think position of a ship
by sound of propeller
Could be triangulated
+ torpedo fired without
a periscope -

Think Mine could be
strung along coast 50
miles or less out + controlled
by cables + fired by a
submarine -

Can a gyroscope be made to guide a small balloon with camera & when out a certain distance by a time clock stop on & start another gyro to bring it back.

Study up the Range finders & the glasses they use.

Can a special small gun 2" be made to ~~shoot~~ prove the range by making a hit giving on striking an enormous amount of dense dragging white smoke & firing rapidly. If the characteristics of this gun is normally known the big gun should score hits from actual experiments.

Why not make a very small machine gun with a removable brass chamber into which from a coil lead wire is fed using $\frac{1}{8}$ " bullet this is cut off & from a coil smokeless powder is fed in & cut off. The second used to feed - when removable brass bush is worn remove it use the gases from powder to compress ~~the~~ air to cool the gun.

Alter the feed so more or less of the powder tape or cord is cut off according to the range.

$$\frac{\partial}{\partial t} \left(\frac{1}{\rho} \right) + \frac{\partial}{\partial x} \left(\frac{v}{\rho} \right) = - \frac{1}{\rho^2} \left(v \frac{\partial \rho}{\partial x} + w \frac{\partial \rho}{\partial y} + u \frac{\partial \rho}{\partial z} \right)$$



4500 ⁰⁰⁰ - 7-
3 1/2 hour

1 1/4 Rev sec
now 30 sec to Rev
or 25 times slower
of 800 waves sec
only 32 waves

2.7 500 32

3 1/2

36 135
108
2720
2720
2720

38. 100

4/320
75
225
2000 1200 400
1000 2500 225
500 4075 3125
4 3 1

4.5
3.9 c Reg
0.6

5.1
3.9
1.2

4/500
125
75

3125 400
300
800

3.12 Chats back

500 4075 5.1
4000 75

200- 200
100 c. fin 600
400 chks 300
1100
25

400

3600

300- 500
400- 500
1500 3600 245
245
4

Notebook Series -- Notebooks by Edison
Notebook, N-14-04-03.1

This notebook was used by Edison during April 1914 and was annotated at least once in 1916. An entry on the first page indicates that the work was done at Edison's laboratory at Fort Myers, Florida. The book consists primarily of 87 numbered entries entitled "Notes on cause of Low % of good disc output." The entries describe ingredients and processes involved in disc record manufacture, identify the potential sources of problems, discuss experiments done by Edison to improve record varnish, and suggest additional experiments to be performed. In entry 58, Edison noted that the problems resulted from variations in the thickness of the blanks and consequent differences in pressure on the transfers at different spots. Following entries 84 and 85 are several pages of notes on separating nickel flake and nickel hydrate recovered from old storage batteries and on a "New Scheme" for the battery. Following entry 86 is a list of eight "things to 1st receive attention" when Edison returned to New Jersey. Near the end of the book is a one-page summary of the results obtained by William W. Dinwiddie in his experiments on the expansion and contraction of Condensite veneer, along with the notation that the information was "Entered in 1916 Book 3." There are also some calculations regarding wages and general expenses. The notes indicate that Sherwood T. (Sam) Moore and Ludwig (Louis) Ott assisted Edison with the disc experiments. The front cover is labeled "Disc Records. Fort Myers. 1914." The pages are unnumbered. Approximately 60 pages have been used.

Probably due to
Ternio Alkoxide
in Penta cause
of smudge or easy
leaving plate

H Myers

April 3 1914

Notes on cause of 100% of prod
disc accident

1 = Temperature of Blank is
different from transfer when
assembled or one is been made
longer than the other with
Consequently more internal
strain

2 = Penta smoke or smudge
may act as a surface
lubricator & do good, and
when Penta is carried too
long in Chlorination smudging
material may be absent or
reduced, smudge may allow
slips. When we didn't use
Penta, % very low, cracks
but the moment used Penta
% went way up, but
smudge was great



3 = Pentachlorination carried to far, too acid, also oxidizes, it oxidized no longer soluble in water. I remember however when we were using white distilled penta + was getting high % suddenly % of transfer went bad without any change in distilled Penta.

4 = Look out for rapid Oxidation of Penta. I have noticed Penta being blown out of Varnish on plates while evaporating. This would tend to segregate Penta. The precipitated Penta shows especially when air strikes Varnish + waves are going on -


5 Too much water gets in the various materials used for making Varnish. Alkalal Wood powder, Resin, 6/4 -

6 = Formaldehyde in Digestor
Escapes + makes lower grade of
Resin hence large part of 6/4
added is neutralized -

7 = Edge of blank in Transfer press
is exposed to air + chills quicker
also more reaches steam
temperature - Center always hotter


8 Some men open water exit wider
than others also, water entrance
end cools quicker than exit end,
gives unequal contraction
Some steam valves don't shut
tight, steam leaks into cooling
water, hence blanks not chilled
so quick -

9 = Air draughts one day different
from other days & temperatures
different. Copper leading in
pipes condense steam & get lower
steam pressure or temperature
by air drafts



13 = Ovens cool down from 225°
quicker at times & produce
straining. Cooling with cloth
covered trucks not long
enough & go to press strained

14 Wiping rags in Print room
greasy - permits slip on smooth
edges of record when not welded
at spots & this starts crack.



15 = Bad Prints not enough
press phenol & transfer gets
too hard making varnish too
hard to flow a file want more
press phenol, increase bad prints

16 = Penta, oxidizes in mixing Bowl

17 = 4% HCL left in Pentacyclics on
Calylases & makes harder
Varnish so can't flow in printing
Must soften Varnish to get
fill —

18 German plates have at different
times a smudge or residue
absent on other days. This
affects transfer — this smudge
or residue may have same
effect as sesame,

19 Too much alcohol used on
plates — one condition of
Alcoholism & draughts nearly
all goes away — other days
but little goes off



20 = Without Penta, or Para we
get very low % 40 to 50
With Penta some days we get
high % next day low %
Effectiveness of Penta depends
on some change in process.

21 - Once we made lot of Varnish
with only 2% Para no Penta
got 100% transfer or 100%
Print never got anywhere near
it again ~~in Para~~

22 Once we made lot Varnish
using only Para 3% it
ferd & went solid in 2 hours
in bottle then reduced it
to 2% & this was used in
No 21 above. DeHaens old
Crude Para. Now can't get
it to ferd within 24 hours
why





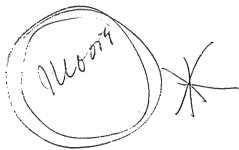
23 Very few prints show conspicuous cracks in print room - in room next to print room shows 2 or 3 times cracks. Then they go to Inspection Dept. & they find 25 @ 80% more. This shows that the Venice is changed & our draughts & handling causes cracks - (C & S) should put holders in boxes & immediately. Records are removed from moulds should be put on holders in boxes & lid put on & held 24 hours before unstacking to allow strain annealing.

24 Grease from hands get on blank on transfer and on print, the transfer - No weld on transfer. On transfer no weld on spot & get crack on print, no grip on edge at spot & we get cracks.



25 If varnish cracks after taking out of Oven by a breath of air & when practically within a few degrees of the Atmospheric temp - or if out & skinned then put in a draft or little cooler than room temp & they sometimes crack. Why shouldn't Prints crack if exposed to air after coming out of press. Why shouldn't they be given time to anneal.

26 After Prints are taken from the Mould. They are under great strain of those which are not cracked many will crack depending on position they are placed & air draft. Should be given a chance to anneal.



27- Possibly we should let
off the pressure in both
Transfer + Print very slowly
after Cool, taking 12 or 13
minutes, to no pressure on
garage then rapidly
after that. There will be
relief of stress may make
a snap or crack. a thing
can be done gradually
that will snap if done
suddenly -

Also possibly pressure
let down with heat
as it goes down especially
after Varnish is set,

28- Think we do not wait at
our press. Phenol in Varnish
Patches if proper quantity
of blank surface will be
soft + flow easy + stop
good prints + little wear
OK - any great excess will
cause diamond to cut

29- Think that success is very variable as to free phenol in some way if we are really testing the free phenol condition should be devised -

30 = The action of 6/4 with proper amount of free phenol in Varnish is to harden the resin very hard & to turn the free phenol into a soft tough Condensate Tough at Low Temperature. If not enough free phenol Varnish is too brittle & does not plastic enough for our purposes. If too much only defect will be that Resin will not be hard enough & free phenol has soft it will give high prints but Decumens will cut & it will be softened by alcohol

31- Over End March to April
probably due to variable
Phenol, when formaldehyde
Escape was probably not
more plastic Varnish if
not corrected properly by
Haffmans if made without
loss to phenol loss
hard & we get poor results.

32 The reason Para for
Varnish quicker at one
time than another is due
to variation of free Phenol
a low free Phenol Content.
Varnish will be thicker in
say 3 hours than it would
if excess free Phenol
used -

33- Blanks vary in amount they
will diminish in thickness
in Transfer & Print presses
from bad mixing of Varnish
or poor baking in every thing
being in different positions



34- Perhaps we should put some
free phenol in wood pulp
Varnish -
Possibly Penta & Para to
toughen it + make it some
plastic

35- My chemical Room experiments
with $1\frac{1}{2}$ " plates with great
excess of phenol show that
a surprising excess of phenol
can be used, in fact no limit
until the board wears

36- Noticed at Myers that Condensate
made direct from phenol & $6/4$
is very little affected by
KOH. Cold The small % of $6/4$
2% dissolved out & precipitated
by ACP is like spence gum
for Cheesing - Better try it
with hot 25% KOH, if good
residue could use as a
filler for battery board rubber

37 It is possible we have
too much free phenol +
it crystallizes + makes it
Contract to heavily around
110 deg.

38 Perhaps if we need more
free Phenol that when we
have the right amount in
Vessel it distills off in
Oven by going to high or
keeping it too long at high
temp.

39 We should try an excess
of Phenol + then run at
lower temp in Oven to
prevent distilling off.

40 - Perhaps with our present
uncertain amount of free
Phenol, it would be safer
to come down 10% on 6/4
or until it don't Contract - this cheap





41- We should test our
phenol regularly for % &
impurities +

42- Perhaps our sensors are
getting thin from using
varnish at too great viscosity
being thin there is no margin
of flow to take up irregularities
of blank & make good prints.

43- I notice when draught
is strong over varnish plates
while taking that the top
is very hard & brittle & bottom
comparatively much softer,
possibly too much draught
in cover is not good.

44- If we don't grind the blank
powder fine the blank will be
denser & thinner & by time it
reaches print press it won't give
& permit a fill - the finer the
more difficult it is to hide it.

It has a spring back to it.

45 & In this connection to get a greater spring back to stop poor prints etc might try $1\frac{1}{2}$ to 1 instead of 1 to 1 of Keweenaw wood fibres. This will be far more springy & of ground fine, still more.

46 Today took

10 grams Anhyd Phenol
700 mg 6/4
1400 mg Moderately soft Prints
not washed.

Put in dish in Copper oven & over a period of 7 hours got it to 220 - Result was

| | |
|-----------------|----------|
| Original weight | 12100 mg |
| Residue left | 5700 " |
| Loss | 6400 |

It was solid black brittle even in cold but softened heat of hand & at low temp was very thick



Tarlike doughy sticky & tenacious
I think the first phenol in
Resin Veneer gives this -
It might be a good idea to use
phenol free Resin in Veneer
& then make a lot of alcohol
Tar add 5 to 10% to Veneer
It certainly would lower
the softening point & prevent
Records cracking & give a
free flow for printing -
By regulating the 6/4 in
making the Tar. Could get any
result required -

17 = Here is a good scheme.
Print record, keep pressure
on, the blank & Veneer will
be cold & not cracked, now
turn water off - put on steam
for few seconds till Veneer
heated up slightly - Cut
off steam & remove
pressure & take out mould.
The Veneer will be expanded
more than blank & can't crack.

48~ We should get up boiler
bath soon & put a test
Varnish plate in with a
Vicat needle to get the
softening point - perhaps
immerse in water & that
heated would be more
even. If a plate with
around diamond Repsol wear
test then the Varnish that
softens nearest say 80 Fahr
the less Cracking or poor
prints -

49 Varnish sent to improve without
6/4 - acts differently
at whole line of prints can be
made - Varnish made & put
in drum without 6/4 & kept
& when I wanted 6/4 put in &
mixed -



50 - Another type w/o keep plate.
24 hours before cooking

51 - Perhaps Chloride of p-Phenylene
diamine would be better than
Base, or acetate

52 - Recently given mix 10% or so
Raw wood glue + fine with
black powder for 6 hours &
then get electrocyclically with
Lampblack

53 - New scheme - melt very thin film
Dip thick w/ coal Tarblack over
surface of glass strong alcohol
6/4 Para Penta solution with brown
or otherwise dry + print direct
changing alcohol to Condensation
the surface layer

54 - Test the Varnishing Experiment
Ott is doing -

55 - It may be too high & too long on high becoming a bit tacky matter so that my temporary Veneer not plastic enough & also not enough sandage to render run on press surface that will press the transfer from plate. Old Paula that I sandaged always come free

56 - In a short time, while sandblasting from wiping plate maybe left on plate - that makes them come free & the film stays on transfer block & helps in printing -

57 - Para once condensed Varnish in 2 hours. Evidently some impurity did it. What was the impurity -

58= I think we have the trouble -

It is this - The blanks vary in
Caliper, several thousandths
on one edge as against
the other. The Top & bottom
of press is flat if it happens
that more than edge of blank
occurs on the right or near
to each other the pressures
in compression are very
different. In other words
these variations in thickness
produce unequal pressures on
one side of blank & these
bad defect multiplies by
using 12 at once.

Our bug is the piece just
as everything has pointed
that way -

Even if Caliper of all blanks
were even this would not
simplify that when pressure
was on they would be
even - as in mfg blanks it
is impossible apparently to
make a blank of even density

59 - To get around this bug
is going to be different.
We can calipers & place the
thick side edge in mould North
& next one South West East
Next West 450 on the 12

(1) 2 (3) 4 -

Nearly Even - Each blank being
corrected by a quick correct
movement of thick edge, marked
by white spot on edge -

The only thing that concerns
is the variable density which
is not shown by Calipers.

60 = A false plate & possibly one
platen removed - Top plate
loose with a ball joint to
get center pressure to permit
platens to lift & accommodate
themselves to variable bulges
of the 12 moulds & platens
combined -

61 = Possibly Can get rid
of mounds & plateaus -
Thru



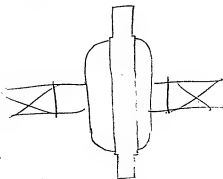
Assemble 50 blanks with plates
of Varnish each side pile them
on top each other. Then another
50 - put both in a tube -
Heat by gas & when temp
is 350, put on pressure 15 min
Keep temp constant. Then
remove & cool slowly -
With thick rubbery coating pressure
& Swivel ball - gets even pressure
Possibly steam jacket used
to heat, steam superheated
or just Hot Air -

62 - Calliper by a round device -
slowing high end Low end, ref
blank. Then place the
mild steel piece High end,
N S E + West, This gives
up piece + eliminates getting
too many high ends on one
side of piece -

63 - Lay blank on hot plate use
hot conical rollers under great
pressure roll blank out to
same thickness -

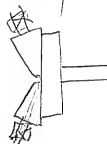
64 - Grind one face against
Emery wheel or grindstone
trued up by diamond
then clamp a chuck against
a face plate Chuck claps or
lapped ring - face with carbide
wheel or turn with a diamond

65 =



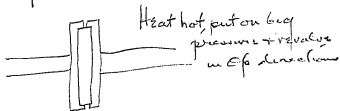
face edge + sides in 1/4 inch
both sides or one side to get
a true bearing to face by -
+ turn both sides with diamond

66 -

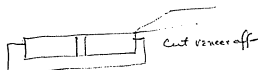


Conical rollers
true up Disc

67 =



68 -

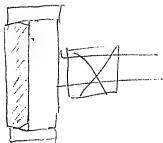


to true blank -

69 = Put in top & bottom of press
One inch top & bottom of asbestos
to permit alignment of platens
with uneven blanks

70 - 1 ft dia Ball joint in Top &
Bottom of press to permit
alignment.

71 =



Blank (better) two ways, - use chuck +
to turn off the taper on edge,
face with diamond - then turn
face other side - 400 Rev Min -
give 2 Cone belt Counter shaft.

72 - Press a cake 10", 6 long
Chuck + saw off disc blanks with
diamond saw Could use a
steam jacketed Cylinder for
Mould.

73 Use square mould + pack
powder same as we pack
iron packets, then cut or
punch out discs

74 = Print turn heat off, wait $\frac{1}{2}$ min
turn moulds $\frac{1}{2}$ way around +
heat + print, then cool -

75 - Calliper blanks, put red
mark on edge of center of high
side,



assemble N S E + West,

76 = NEW = there is a bug

in failing to keep up the pressure
in cooling. The men let the pressure
go down from malleation, then bring
it back. Sometimes it goes way
down before they notice it -

Now suppose 3 video had met
at the pressure + on 1/4 had
light pressure. The fall on cooling



Might not be enough to loosen the grip on the heavy pressure point but on the $\frac{1}{4}$ of area where pressure is light the grip is smaller & it will not stop Venice from contracting hence cracking. The only safe way is to not only stop those loss of grip by not losing pressure but would be good to actually increase it. This probably explains why some men get better % than others. Even snipers of caliber will stop it.

77 - I think that if pressure of a vehicle is say 1000 lbs that the moment we add pressure shows slightest leaning to face that it would be well to drop to 1100 lbs. (or less) - this would prevent loss of grip on certain surface.

76 24 Veneers 15/1000 each
Can deform down to 89/1000
down to 22/1000 -

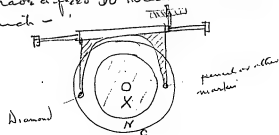
If we have 24 veneers in pieces
15/1000 thick this is total of 360/1000
of Veneer

If deformation is necessary to correct
when collapse of blank is 8/1000
on one edge 22/1000 on the other
it gives a deformation to each blank
of 28/1000 or 336/1000 to the
12 blanks -

This requires thick sections at top
& bottom to allow alignment of
plates -

Blanks more than 22/1000
thicker at one place than the
other is bad 22/1000 is the limit
and it should not be more
than 11 to 12/1000 -

49 To test blanks for thick & thin edges - rotate blank - have a feed 50 threads or less to inch -



X top plate

C platen

N Revolver - held down flat,

When low side passes under Diamond the pencil comes down & marks



This idea can be worked up -

80 = In loading use thin



removable metal separator partition.

weigh 4 portions of wood fibre put
on in each - Remove X - then
whole will be even to extend with.

81 In embossing the tits on working
mould connect the tits together
by a .002 to .004 high 10/100 wide -
Emboss - On parting this will
hold the veneer while contracting
+ in final. Edging come off +
D22 if bases have not been changed

MG

82= Cracks never start on second part, but only on smooth, its because stress is not held on cooling - NO 81 should fix this

To stop it at transfer, make a Chaser with $1/8$ wide of fine teeth 150 Wires & chase the Varnish plates clean to edge this will hold it in press when cooling on partening it will not show -

We could chase smooth part of second also, & Miller could track all new ones -

On transfer plates as they are irregular can use an advance ball like on seconding rollers see also own patent for a transfer ring at edge use think it for sign

83 - Possibly we want to run
Varnish plates up quickly as
possible to reach the rubbery
state then there is no danger
of Segregation of Penta Para or
6/4. Then can go at once
I think this the trick to get even
contraction & softness -

84 = Making Veneer -

Used small quantities of following
in Sec Varnish ~~was~~ poured from
Rag Vap a small quantity into
a separate dish & added the
chemical & stirred it then poured
on one of the little plates -
Let all stand in air over night
& then gradually heat up to
185 -

After being all night in air
none dried,

used
CoSO₄
Fe Tartrate
1/2 Picramnic
Cu Nitropersulfate
Cu Oxalate
Fe Sulfocarbonyl
K Sulphite
Ba Sulphide
Aluminum Chloride
Antimony Chloride
Cu Cy
Sulphide Zn
Cu Chloride -

Practically all went Rubbery
around 145° Fahr

SbCl very rubbery
AlCl "next"

If pencil pressed in either, no hole
of deformation left, not true of all
the others they come back slowly
+ leave a slight mark,

SbCl is the most abnormal

at the lat, HCl made lots
bubbles - SbCl acts apparently
precipitates, turns from black to
brown surface not flat or shiny
seems thinner than others, there
are internal bubbles which
raise up a give a mottled surface
of little hills -
all others shiny - keep the next
SbCl least HCl next,

At 160° SbCl still very rubbery
all the others very stiff rubbery
+ all about the same - HCl
probably a shade harder.

185° SbCl still abnormal
Still Rubbery

Reg + only blistered.

On Nitrophenols all blisters

Bas Sulfate next hardest to HCl.

Reg + only smooth + no bubbles

K Sulfate Cold Cuts Tough, head like

Separate from plate hard

Bas acts little tough separates OK

AlCl Whitens plate, cuts semi tough
Comes off hard -

CuCl seems tough & separates good

Zn S

Cu Cl - brittle dont separate good

Fe Picomitic brittle, seps hard

Fe Tannate " " fair

CoSoy Prillie seps good

Cu Oxal " " only fair

Fe Sulfo-carbolic Semi tough seps fair

H Reg brittle seps good

Ce Nitropermanganate semi tough cant seps well

Antimony chl trichl - tough like

leather, flexible like leather cold

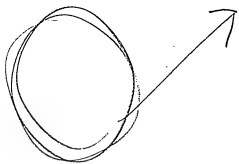
immersed in alcohol can

fold it, Not dissolving at

water no effect.

While SbCl₃ is softer than cellulose
it cant be scratched by finger
nail - and with a knife (ink
scratches Reg bad dont
scratch SbCl₃ its tough -
dont chip out when knife is raised

possibly only know LiCl
or CaCl_2 would not



over it, I used altogether too
much SbCl_3 its proximity
probably lightens it,

I find SbCl_3 is precipitated by
water, giving white ~~precip~~
precip "Ergograph" = "

SbCl_3 dissolves in alcohol
there is a precip white from
water in alcohol I felt
the precip aff got clear so I
then added water say whole
precip came down +

Evidently when I added the
 SbCl_3 to Ray Van it took
out the water + formed a
precipitate in the Vermine
The white pp turned it from
black to brown
Came off plate hard

Something in SbCl_3
Sweet —

S Battery ~

Shine Hypocrite Soda good for
separating, but expensive.
Clean after separation with 1%
H₂SO₄ or perhaps HCl, if lumbered
in test my experiments shows
cleans flake nice & bright
nickel & steel flake -
(with HCl for cleaning very little
of NiO₂ separates but flake)
but more about the SO₄ used

then use the 1% acid just enough
to make mix little thinner
than a mush

Can float most flake off
by old way of letting water
up from Carbonic box
in the 1 after then big
flake can be screened out
The NiO₂ is largest & OK
for reuse -

Next page

85 = Further Experiments show that
SbCl₃ don't toughen what it does
do is to delay the final
hardening, by running all
up to 18d 19s after shipping
from plate, they were all bright

Ferric Chloride was the only one
of last lot that was remarkable
it came off the dash perfect not
sticking as all others did -

Mixed bunch of such in Reg

Sb S.
Hg S.
Cu S.
Sn Cl
Bi Salicylate
Ferric Cl
Pb Hypophosphite
Sn Bi Sulfide
4 strings of SbCl₃
Reg -

I notice when I pour the varnish

Battery -

Contingent tests are made of N₂O₄ separated metal be boiled in a liquid to see how to green or not,

Perhaps the powder white the ads to deviate out something forming a double salt,

Perhaps other salts which tend to form double salts with lake further things will after hypo has been washed out,

Next page

on the little plates, that the SbCl₃ shrunk very much in bulk. This seems on $\frac{1}{2}$ thickness of all the others

at 135, all were condensed to rubbery state except SbCl₃ almost very very weak still was slightly rubbery - the other 3 SbCl₃ not condensed
160 fairs all condensed rubbery except SbCl₃ which was

it was after being at 135 in all hard - some still has dull appearance -

When taken out they had most bubbles + strong stink rest.

Put them all back & gave 1 to 2 hours were at 190 to 200 - all reached hard + 3 consecutive all hard + about the same in properties -

From these experiments it is

Battery = New Scheme

To make our reg NaOH porous
we say 1 to 3% H_2SO_4 acid -
dry the NaOH , then just
mix it with the acid
solution, dampen it so to
speak, then press it, all
the acid will go in the pores
if left all day, then it can
be washed out leaving
the NaOH porous, any degree
of porosity can be attained
if desired. — —

I noticed when I tried on
plate & its from acid cell by
 $\text{HCl} + \text{H}_2\text{SO}_4$ -
 $+ \text{HCl} + \text{LiCl} + \text{HNO}_3$ later
gave no black from float
stuff - whereas H_2SO_4
gives some —

Easy to see that the open times
& temperatures are VERY IMPORTANT

to get a tough veneer don't go
above 200° & don't hold too
long at high temp, 4 or 5 hours
& perhaps even at 150° & 100°
that is required for 1st stage is
Rubbery Condensation around 140
for 1 or 1½ hours; 2nd stage is
hardening & driving off alcohol
etc, if stopped here, veneer is
tough - 3rd stage is hard &
brittle 190° to 200° for 1 hour

When get main change
schedule to get harder, final
& stop 6 hours at 160 stage,

I made some very porous
transparent stuff from using
an insufficient amt of formaldehyde
morphol than absorbed
water, 24 hours - This
ought to be a good addition
to Venenish

86 = I feel sure we can make
2nd prints by using condensed
Venus on metal & bring to
rubbery state & just as sand
pour on metal with some water.
min. - Then print by using hot
water don't think it is better
more than 150° or less -

Could also use $\frac{1}{4}$ g. base
mounted in holder flat,
flow & condense out of base
remove to holder, print,
remove & plate,

Think the same condensed
Venus will take 110° or 120°
if temp has been kept 100°

When I arrive Home These are
things to 1st Receive attention

1st Make up into old Cell mixer
operated by 6 diff chemicals
Wash + treat with H_2SO_4 -
Acetic H_2O 103 4.5 g. pro. 10 g.
No crushed + mixed
Sawin - test in small tubes
Rep. flake by Critical box + test saw

2nd Decide bat X-ray + make
mechanical tests

3rd Start men on making Even
Caliper blanks

4 Extra phenolic Varnish + try
new overschanks to get softer
Rever - 190°

5 Flow Condensate with ring on
glass held in metal ring -
Use it just beyond Rubber + large
Use 150° To print

6 = Test phone ~~coax~~ ~~cylinders~~

7. Music

8 ~~Viol~~ ~~Suit~~ -

89 = Inspection of prints & fingerprints
sent by K. M. R. to have first
blacks, and print comes from
Hecker on a scale than the
other

not print

206

246

Nearly all prints have been
prints @ present & each after

Nearly all cracks start

from Edges and also
 are always as a rule on places
 showing no print, not gripped
 3 prints in mass found to
 be all because of dirt in the
 ground over piles these
 should be ground out,
 where and went it kept to each
 other the diameter of prints
 is greatest at the point,

Cracks are widest on top,
 some scrape out and are
 black & hollow, no trace is
 blank when I run but they are
 very narrow & closely to each other

Cracks seemed to be caused
 by a clutch at edges no
 grip & movement is due to
 Contract, ^{sliding}



Two persons gave
over prints & they came place &
after some kind of hearing, coming
second records sent right.

_____ this.

10% should Calliper when coming
- either when set or place
of person. Here is another
chance for inspection in
frames kept.

Calliper when using it
Edge OK - No contact on
side in

Yet Calliper only 1/2nd of a
1/10000000000 - this is
unexplainable -

It looks as if all blank^{area}
that will not separate can be
either double transferred or
turned & separated or
double transferred, those
that have cracks will not
double transfer but can
be turned & a full transfer put
on.

Notice one ^{transfer} point that has
squashed, set round -

Now this shows bad mixing
too much in Carroll in feels -

Result of Expts with Vermicul
Reg + Reg with some viscous
Semi Condensate in — For use in
submaster work —

We can use $1/4"$ glass, or true
up porcelain perforated in a wheel
Mould — Flow the glass, porcelain
or nickel with a casting around it
like old submaster C's per dentite.
Remove ring after drying — Then
put it in Water Jacketed Oven
or bring up to 145° @ 160°
for 2 or 4 hours or less — Then
Mount in supporting holder &
print at about 120 to 130, Cool it,
Then graphite it & Electroplate
by specially filtered Vermicul
& putting in clean oven, filtered
air draft then a no heat filter
a while, we should be able to

discard the dried Cellulose

Think the Semi Condensate Vasoline
like much or a much not acted
on by $\frac{1}{4}$ will be best to help
grafting - not sure, try -

Reg + Reg with Semi Condensate made

| | |
|---------------|------------|
| 2 hours out | 117° false |
| 1 | 120° |
| $\frac{1}{2}$ | 142° |
| $\frac{1}{2}$ | 160° |

Too soft yet, Cant strip from plate
but the one with Condensate much
comes off

Sections of both when cold are
flexible like leather. The much
one much more than without much

When Very cold Reg Cracks
showing that at 160° would answer
for submergence. But the much
one don't crack - but remains
flexible + too soft for submergence

after $\frac{1}{2}$ hour Reg can be stripped
alone - Top fairly hard, underneath
rather leathery

$\frac{1}{2}$ hour more 178° of false
Reg seems hard enough for
use dive lamp - Sticks
hard to plate, Cant carry off hat
Muched Var comes off but hardy,

after getting Cooler Reg comes
off but hardy,

I made the copy Semi condensate
by condensing phenol with
very small quantity of
formaldehyde. It like
Vaseline but melts out
threads -

There is a big difference between
mucked Vanish & Reg

Believe we can work good
Van in Oven at 180° Fahr

at 160° is OK for submersion
mucked Van - Very flexible, Reg OK

Keeping it at 180° 3 or 4 hours
now it was unnecessarily hard

180° Fahr Mucked stuff taken
immersion of 10 sec OK
it looks as if mucked stuff too
graffiti OK -

Only one defect & that is top
of Under very much harder
than the bottom,

142° Fahr Vanes takes graffiti OK

Records sent to Ft Meyer
Prints
April 14 1944
Diff in Calliper

004

014

009

007

015

003

033

033

018

003

014

010

019

Dimordies Expts on Contractions
& Expansion Req Condensate

| Taken | Contractions | |
|-------|--------------|---------------------|
| 192° | .0345 | } 0.001 per deg + 1 |
| 175° | .0329 | |
| 150 | .0320 | |
| 127 | .0309 | |
| 100 | .0299 | |
| 75 | .0290 | .00017 |

Vacuum takes permanent set as low as
125° @ 130 with only 10 gram load to
1/2 inch strip 2 1/2" long but time
must be allowed

On cooling the shrinkage is greater than
than the gain in length from 135° to 121°
after this it contracts .0006 in 2 1/2"
when to 100 after 13 minutes
more = Toward strength at 100°
is temporary, set goes 200 etc a
battered jelly

W. H. Jones
1916 March 3

Wagner & Gail Exp

\$ 1016 per day

Blank 5.8.

Wkg M 1.0

6.8

2000

64.8

3000

40.7

4000

32.2

5000

29.4

6000

23.7

7000

21.3

$$\begin{array}{r} 2000 \overline{) 1016.00} \quad (5.8 - 5.8) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 3000 \overline{) 1016.00} \quad (3.4 - 3.4) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 4000 \overline{) 1016.00} \quad (2.54 - 2.54) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 23.7 \\ 6.8 \\ \hline 23.7 \end{array}$$

Transfer Blank 5.8

$$\begin{array}{r} 7000 \overline{) 1016.00} \quad (14.5 - 14.5) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 5000 \overline{) 1016.00} \quad (2.3 - 2.3) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 10160 \overline{) 1016.00} \quad (16.9 - 16.9) \\ \underline{1016.00} \quad 6.8 \\ 0.00 \end{array}$$

$$\begin{array}{r} 14.5 \\ 6.8 \\ \hline 21.3 \end{array}$$

25

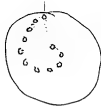
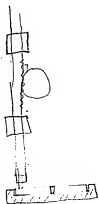
12500

$$\begin{array}{r} 748.00 \\ 268 \\ \hline 1016 \\ 268 \overline{) 1944} \\ \underline{1944} \\ 0 \end{array}$$

$$\begin{array}{r} 6.8 \\ 3000 \\ \hline 20400 \end{array}$$

$$\begin{array}{r} 7000 \overline{) 20400} \quad (2 - 2) \\ \underline{14000} \\ 6400 \end{array}$$

$$\begin{array}{r} 26 \overline{) 6981} \quad (268 - 268) \\ \underline{6981} \\ 0 \end{array}$$



Notebook Series -- Notebooks by Edison
Notebook, N-14-04-26

This notebook contains dated entries from April and May 1914, but it may have continued to be used as late as July. The entries, which are all by Edison, pertain to experiments aimed at the rejuvenation or "regeneration" of used storage battery components. The entries toward the beginning of the book deal mainly with the nickel flake and nickel hydrate mix from old positive electrode "tubes." Included are lists of chemical compounds, along with results of tests performed on cells constructed with various regenerated tubes. The entries in the middle of the book deal with the iron from old negative electrode "pockets." There is also one page of crossed-out notes on the manufacture of disc records. The battery experiments bear sequential numbers, 125-141 and 142E-240E. Experiments 129-184E involve various chemical compounds that were prepared by Ludwig (Louis) Ott and used to treat old nickel. These chemicals are described in N-13-10-05. Some of the cells produced in experiments 142E-240E were apparently transferred to the Edison Storage Battery Co. at Silver Lake for continued testing. Their subsequent performance is tabulated in N-14-12-14.1, and the sequence of experiments is continued in N-14-12-03. Inserted into the book are two reports from July 9, 1914. One, addressed to Edison by John V. Miller at the Edison Chemical Works, reports on experimental pockets prepared for experiments 240E and 250E-252E. The other, addressed to Robert Bachman, describes several experimental pockets prepared for Edison. The front cover is labeled "Somewhat Important" and "Regenerate No One." The pages are unnumbered. Approximately 120 pages have been used.

April 26 1914

Regeneration of Nickel's flake from 4 yr
old cells that have gone low in
Capacity

Note that flake & green from
use of glycine + ROH as dissolving
agent, on treatment with acid
when glyc + ROH are washed out
act different according to acid
used -

2% HNO_3 gives clean solution only
little green color

2% H_2SO_4 ditto

2% HCl gives yellow green
milky liquid & does not get
clear, dissolves Ni but sw
filling. ~~is~~ Muddy yellow
Colloid continues to run
then, apparently no let
up, even after acid gone

The muddy liquid treated
with HNO_3 becomes green & clear
showing mud is mostly nickel
The clear sol. precip. by ammonium
hydroxide a small amount of
white yellow iron - possibly
 $\text{Fe} & \text{Al}$ -

This is true with 1% HCl &
2% HNO_3 - but not like 2% HCl

Evidently HCl has some
action that the other
acids haven't.

The only one that is perfectly clear
is H_2SO_4 -

I am preparing 4 batches
of 4 yr old mix from tubes -
These have been put in
5% 10% 15% & 20% glycerine & water
& 3% KOH or NaOH in all

5% didn't deintergrate all -
10 had more deintergrated
15% all CC cores
20% all cores deintergrated
Kept them in flasks on hot
plate with 1/8" asbestos
between flask & hot plate
They were sent to Geo. Bailey

Lot 11 Nov

129 - Considerable pieces not
broken up

132 Nearly all broken up

130 Nearly all broken up

131 - 4, good

136 - quite amount of colloid
In ammonia

This is K formate &
it may take out
chromium etc.

I now put 2% HNO_3 in

10th #

136 NH_4 pump considerable colloids

126

127

134

135

125

128

They all have been well
washed - 10 or 15 fresh
waters - put acid
- mix of N_2 & H_2O -

No colloids that run through filter
in any of above, like HCl in
glycerol & mix -

All above about same
degrees of penetration

The least green is from 128 -

of the glycemic series -

Only HCl , shows ferric
ion - HNO_3 H_2SO_4 &

$1\frac{1}{2}\% \text{HCl}$ $2\frac{1}{2}\% \text{NO}_3$ white f. flocculent
precipitate alumina -

Apparently to the HNO_3 that
takes out the alumina
 H_2SO_4 takes out some

But $\text{HCl} + \text{HNO}_3$ apparently don't
take out ferric only the
white pp,

~~It~~ It takes 3 or 4 hours for
the alumina to come down

None of the previous #
were green except glycemic series

Salicylate cant be washed
Pres. of Na or K Salicylate -
approximately -

$\text{HNO}_3 + \text{H}_2\text{SO}_4 + \text{glycine}$ are
the best to work no sulfide

of the solution (acid) felled
off from previous Krimbo
except glycine series -

129 & 134 ~~are~~ have the secret
but it will require longer
time to be sure -

129 acid sol felled off & 1164
Very large white Al sic
precip - has a reddish tinge
showing ferric -

Offs 7005 —

Net

129- 50 grms 5 grms glycer 100 cc 3 grs NaOH

130 " 10 " " "

131 " 15 " " "

132 20 " " "

56 Hours

Left on hot plate, with circulator in between
in flask is —

Put the whole of the 100 cc in
each flask —

133. K Hypophosphorus —

~~134~~ 134 K Sulphide, liver of S

135 Na Salicylate

136 K Formate — white precipitate

137 Na Formate

138 Glycerophosphate Soda

Offs #

139 Sodium Bromide

140 Paramidobenzol dihydrochloride

141 glucose

128- 100 cc 20 glys 3 NaCl, Col

125 5 @ gly "

127 15 glycerol "

126 10 " "

I have sent

129 130 131 + 132 separated by me

after drying I screened green & flake

thru 20 mesh -

Had to crumble flake a
little to get 25% that stayed
on 20 mesh -

Green left only little flake in

Gave the samples to Bachm

Each to be made as follows

| | | |
|--------|--------|-----------|
| 2 tubs | old mi | old flake |
| 2 " | New mi | " |
| 2 " | old mi | new flake |

134 & 135 -
give big yield of
green
100 gms
whereas
126 & 127
give very small
yield $\frac{1}{2}$
probably lost in
washing. 50 gms

Note scarcely any Alumina
in 135 -

Lots of broken ends
of tubes & caps in
all -

134 - not well disintegrated, hard to
separate flake from the black
some of it goes over with
flake - It will be difficult
comely to separate -

135 - disintegrated fairly
well - Hard wash it
out of flake. Lots of fine
attrition, that runs down
filter -

136 = fairly disintegrated
after acid treatment flake
followed - but only some
flakes -

I think most white precip
Supposed "Al" comes out
128

Note that 20% sol of Cheamman
with tube pieces in dialyses
is 3 or 4 times faster & more
eff than the 2% seeds
even 3% ———

None of the 2% acid sol
HNO₃ H₂SO₄ HCl & AgNO₃ gives
desintegrates the ni tube pieces.

Suppliment
Z = D 72 hours

16 - 72 hours -
dusky brown brown -

Following Dissolution
Ni cycles from all 16

All Dissolved Solutions

- ⊕ 1 = K Carbonate - partial in 24 hours
- 2 K Bichromate slightly in 24 " " " " " " " "
- ⊕ 3 K Oxalate not dissolved Much Ni dissolved
- ⊕ 4 K Perchlorate " " " "
- ⊕ 5 K Arsenite, all dissolved some Ni in 24 hours
It breaks up Ni to Colloid & runs thru filter.
- ⊕ 6 K Benzoate not dissolved -
- ⊕ 7 K Chlorate " " " "
- ⊕ 8 K Sulphite partly dissol'd much Ni dissolved - 24 hours
- 9 K Cy - Totally dissolved - dissolves much Ni 24 "
- 10 K Phosphate Not dissol'd
- 11 Hydrosulphite Totally dissol'd in 24 hours Green Sol
Coals Ni off with Nickel - if boiled all the
Ni is reduced to metal -
- 12 K Bitartrate slightly dissol'd, sol greenish
- ⊕ 13 K Nitrite $\frac{1}{2}$ dissol'd
- ⊕ 14 K Chloride $\frac{1}{2}$ dissol'd, solution little green
- ⊕ 15 K Sulphate $\frac{1}{3}$ " " " "
- 16 K Iodide - completely dissol'd in 2 hours
no Ni dissolved - hard to wash piece of Iodide -
- 17 K Permanganate $\frac{1}{2}$ dissol'd
- ⊕ 18 K Bisulphate dissol'n starts in 5 min nearly
all dissol'd - $\frac{3}{4}$ dissol'd - 24 hours Dark green

19 - 72 hours

20 - 72 " Green ref. Ni

22 72 " - 70 to 105 fahr no Ni diss

27 36 Some Ni diss + some black changed to green

16 - no Ni diss, black curd etc

⊕ 19 K Ferrocyanide dissolved in 2 hours very little Ni dissolved - (10 min)

20 K Sulphide dislgd in 48 hours no Ni dissolved

21 K Manganate S

22 K Hyposulphite Complete dislgd 24h no Ni dissolved

23 K Chromate S

24 K Arsenate S

25 K Bicromate S

26 K Peroxalate - Solution Very green -

⊕ 27 K Hypophosphorous. dislgd 24 hours on dilution with water, green, much Ni dissolved

28 K Propionate slightly green

⊕ 29 K Ferriac 3/4 dislgd

⊕ 30 K Lactate, not saturated sol very green Completely dislgd in 24 hours,

⊕ 31 K Ethylsulphate not saturated 3/4 dislgd

⊕ 32 K Perdisulphate 3/4 dislgd

⊕ 33 K Ethylsulphonate, tube covered with brown flocculent containing brown flocculent precipitate

⊕ 34 - K Carbolate disintd in 96 hours
very little Ni dissolved -

⊕ 35 K Formate not solvntd disintd in
48 hours no Ni dissolved

36 K Urate light green

⊕ 37 K Citrate Completely disintd in 24 hours
solution brown great deal Ni dissolved
Colloid Ni runs thru filter -

38 K Saccharate, Completely disintd in 30 hours
on filtering no nickel in filtrate but a
large precipitate formed to which is
a large amount of carbon
+ contains some Ni Very different
to wash free of Ni

39 K Chlorochromate smells
of Chlorine strong -

Susp

43- 72 hours. Free Ni-
temp. recs from 70 to 125° Fahr-

⊕ 40-K Lactophosphate not sat
Color turns green. probably used
disalored if concentrated as tubes
are all off

⊕ 41 K Sulpho Ethylate not sat $\frac{1}{2}$ disol'd

⊕ 42 K Malabonate $\frac{1}{4}$ disol'd

⊕ 43 K Sulphocyanate disol'd 96 hours
trace of Ni disalored

44 K Ethylsulphuric $\frac{1}{2}$ Disol'd

45 K Percarbonate $\frac{1}{2}$ "

46 Seignette Salt Light blue per cept
some Ni disalored gets very slimy
Colloid runs thru filter Ng

⊕ 47 K Bromide $\frac{1}{2}$ Disol'd

48 K Valerianate not sat $\frac{1}{2}$ Disol'd

49 K Cyanate, disalors much Ni

50 K Tartrate disalors Ni

⇒ 51 K Benzene disulphate $\frac{1}{2}$ Disol'd

⊕ 52 K Sulphobenzate $\frac{1}{2}$ "

53 K+Fe Oxalate Very little disol'd
much ferric hydrox forms

59 - 36 hours - no rise of temp
as in R salt

64 - 36 "

71 - 72 hours no rise but hard to
wash

54 - Na bicarb - -

⊕ 55 - Na Acetate

56 NaCy dissolves much in

⊕ 57 Na₂C₂O₄ Oxalate Sol light green

⊕ 58 Na NH₄ phosphite

59 Na Hyposulphite diss'd 48 hrs no rise

60 Na Bromide sol light green 1/2 diss'd

⊕ 61 Na Arsenate

62 Na Phosphate

⊕ 63 Na phenylate 1/2 diss'd

⊕ 64 Na Sulphite Diss'd 48 hours no rise

65 Na Benzoate

66 Na Carbonate

67 Na Sulphide 1/4 diss'd

⊕ 68 Na Cl - f. lowest precip temp. of green

⊕ 69 Na Bisulphate nearly all diss'd in 4 hrs
diss'd in 5 hours, but solution grew very green

⊕ 70 Na Borate 3/4 diss'd

71 Na Salicylate turns brown with a
salicylate diss'd 48 hours trace rise

⊕ 72 Na Nitrate 3/4 diss'd

⊕ 73 Na phosphite -

74

Na

§2 7/2 hour temp 70 to 140 Fahr
entirely to Egg surface 600 cc for
50 gram max -

74 - Na Silicofluoride - fluorescent deep
white - is this Chlorine -

- ⊕ 75 Na Fluoride -
- ⊕ 76 Na Triphosphate - large of green
- ⊕ 77 - Na tartrate, sat light green deep green
- ⊕ 78 Na Manganate 1/4 discol
- ⊕ 79 Na Chromate
- ⊕ 80 Na Stannate

81 - Na Sulphocarbonate discol 48 hours
was eating much s.c.c. plus deposits
Colored - also in

82 Na Peroxide - all discol 48 hours
green very much. Lot. of black left
on filter paper H_2O_2 3% does same

- ⊕ 83 - Na Baryate
- 84 Na Bichrom 1/2 discol
- 85 Na Urate - 1/4 discol
- ⊕ 86 Na Phosphate Sublime
- 87 Na Benzo Sulphonate 1/2 discol
- 88 Na Phosphotungstate, sat green

rec

95- 72 hours no visible hard to work

113- 24 hours

- ⊕ 89 Na Cinnamate
- ⊕ 90 Na Tartrate
- ⊕ 91 Na lactate Disl'd 48 hours Sol tinge green
- 92 Na stibic $\frac{1}{2}$ Disl'd
- ⊕ 93 Na Borobenzonate
- ⊕ 94 Na Mg Tartrate $\frac{3}{4}$ Disl'd tinge green
- ⊕ 95 Na Sulphaminate Disl'd 48 hours
no ni dissolved
- 96 Na Sub Benzoate $\frac{1}{4}$ disl'd
- ⊕ 97 Na Chlorate
- 98 Na Valerianate
- 99 Na Sulfoethylate disl'd 48 hours Sol very green
- 100 Na Alumininate
- ⊕ 101 Na Sulfovinale
- 102 Na Borate $\frac{1}{2}$ D
- 103 Na K Sulphate D in 96 hours no ni dis
- 104 Na Bitartrate D 48 hours Sol very green
- 105 Na Ferricy D 48 hours some ni dis
- 106 Na Tartrate
- 107 Na Tetraoxalate D 96 hours Sol very green
much ni dis
- ⊕ 108 Na Persulphate D 96 hours much ni dis
- 109 Na Bismuthate
- 110 Na Bromate D 96 hours no ni dis
- ⊕ 111 Na glycerophosphate D 48 hours not salub
- ⊕ 112 Na Bromate $\frac{1}{2}$ D
- 113 H₂O₂ disl'd -

Evidently with proper
 Drains, only 5@7% need
 be treated 93 to 95%
 will be in shape to use
 again —

100 mesh screen will
 screen out all the fine
 Ni from cake - taking very
 little fine flake —
 Done Day —

after washing & separating
 ready for test some fine flake —

134 12.69 gm bar 78.240 Ni
 9.062 fl 100g
 87.302

135 15.12 gm bar 71.70 Ni
 13.18 fl 100 G
 84.58

136 13.11 gm bar 70.112 Ni
 16.770 flake 100 G
 86.882

126 Equiv 1422 bar 35.37 Ni
 7.57 flake 50 G
 42.89
 35.78

127 Equiv 1202 35.092 Ni
 8.83 flake 50 G
 43.897
 37.794

125 Equ 1176 bar 36.45 Ni
 7.27 flake 50 G
 44.12

Tried Key 2% HCl. 10% NH₄Cl
to clean flake - apparently
NH₄Cl cleans it best,

1st taken to Brookman 2 tubes 1. 2

| | | |
|-----------------------------|-----|-----|
| | 847 | 843 |
| | 873 | 867 |
| | 860 | 857 |
| Nat - 1 st | 460 | 467 |
| 1 st taken hat - | 800 | 800 |
| 2 nd " | 693 | 697 |
| 3 rd " | 693 | 660 |
| 4 | 640 | 647 |
| 5 | 607 | 610 |
| | 610 | 613 |

Co

2nd sample - 3 tubes

| | | | |
|--|-----|-----|-----|
| | 827 | 830 | 820 |
| | 853 | 853 | 847 |
| | 870 | 863 | 840 |

Co

| | | | |
|---------------------------|-----|-----|-----|
| Nat | 633 | 627 | 600 |
| 1 st taken hat | 600 | 577 | 550 |
| 2 nd " | 550 | 537 | 517 |
| 3 | 537 | 460 | |
| 4 | 503 | 487 | 417 |
| | 507 | 490 | 473 |

Shovel Lake

129- loaded Reg 4 flake 26 Ni
Reg. camp

May 2nd 1st Run -
New Lake improved old ni old flake
160 mah -
New Ni 383.

Big Cat - 20th Run

| | | | | | |
|--------|-----------------|-----|-----|-----|------|
| #129 - | Old Ni Old Lake | 1st | 667 | 660 | 7125 |
| | 4 fl | 2 | 897 | 850 | 7055 |
| | 24 Ni | 3 | 873 | 830 | |
| | 233 | 4 | 830 | 750 | |
| | 7.125 | 5 | 777 | 727 | |
| | | 7 | 797 | 747 | |

| | | | | | |
|-------|------------------|-----|------|------|------|
| 129 - | New Ni Old flake | 1st | 1050 | 1050 | 7395 |
| | | 2nd | 1203 | 1203 | 7320 |
| | 224 | 3rd | 1200 | 1200 | |
| | 7.054 | 4 | 1223 | 1213 | |
| | | | 1247 | 1193 | |
| | | | 1223 | 1220 | |

| | | | | | |
|-----|------------------|-----|-----|-----|------|
| 129 | Old Ni New flake | 1st | 827 | 877 | 7352 |
| | | | 900 | 860 | 7270 |
| | 252 | | 890 | 843 | |
| | 7.395 | | 873 | 830 | |
| | | | 830 | 797 | |
| | | | 863 | 827 | |

| | 1 st Run | 2 nd Run | |
|-----|---------------------|---------------------|------------------|
| 131 | 667 | 897 | old ni old flake |
| 132 | 660 | 858 | old ni old flake |
| 133 | 1050 | 1203 | new ni old flake |
| 135 | 827 | 900 | old ni new flake |

| | 1 st Run | 2 nd Run | |
|-----|---------------------|---------------------|------------------|
| 131 | 587 | 860 | old ni new flake |
| 134 | 1050 | 1203 | new ni old flake |

238 } 6 864
242 } 6 910 ←

245 } 7 270
240 } 7 265

262 } 7 275
254 } 7 223

232 } 6 437
225 } 6 960

245 } 7 328
248 } 7 415

254 } 7 345
261 } 7 310

130 old n old f
10% glycerine

new n old f

old n new f

131 old n old f
15% glycerine

new n old f

old n new f

1st Run 643 648
2 833 843
3 813 823
773 780
797 793

1st 1007 990
2 1153 1203
1153 1203
1170 1187
1190 1207

1st 643 627
2nd 850 857
846 837
813 827
843 850

1st Run 623 657
2nd 835 833
790 818
757 770
767 777

1st 967 983
2 1157 1190
1157 1190
1177 1150
1237 1200

1st 803 808
2nd 817 823
820 823
803 807
823 830

132 Old Ni old f 1st Run 483 477
 20% Phosphorus 2 673 673
 677 673
 677 725

New Ni old f 1st 1007 1003
 2 1197 1193
 1202 1202
 1203 1203
 1247 1247

Old Ni New f 1st 467 450
 2 677 677
 690 673
 693 673
 723 700

133 - Old Ni old flake 1st Run
 K Hypophosphorous

New Ni old flake 1st Run

Old Ni new flake 1st Run

for Dinitrophenyl Flakes - Ni from 20 lbs.

| | |
|-----|--------------------------|
| 174 | Acetamide |
| 175 | Benzate 50 lbs |
| 176 | 1% HF in Lead |
| 177 | 10% Sol Para Amidophenol |
| 142 | Ammonium Acetate |
| 143 | Benzate |
| 144 | Oxalate |
| 145 | Sulphate |
| 146 | Tartrate |
| 147 | Citrate |
| 148 | 20% sol Formate 5 gms |
| 149 | Hypophosphite 6 gms |
| 150 | Nitrate |
| 151 | Phosphoric - |
| 152 | Sulphate |
| 153 | Hypophosphite |
| 154 | Ferrous Chloride |
| 155 | Ferric |
| 156 | 2% acid Nitrate |
| 157 | |

| | | |
|-----|----------|----------------|
| 158 | Calcium | Chloride |
| 159 | " | Nitrate |
| 160 | " | Acetate |
| 161 | " | Chlorate |
| 162 | " | Citrate |
| 163 | Chromium | Acetate |
| 178 | " | Nitrate |
| 164 | Copper | Sulphate |
| 165 | " | Acetate |
| 179 | " | Nitrate |
| 166 | Zinc | Phosphate |
| 167 | " | Hypophosphite |
| 168 | " | Acetate |
| 180 | " | Nitrate |
| 169 | Magnesia | Acetate |
| 170 | " | Chloride |
| 171 | " | Nitrate |
| 181 | " | Citrate |
| 182 | " | Fluoride |
| 172 | " | Hyposulphurous |
| 183 | " | Phosphate |
| 173 | " | Sulphate |
| 184 | " | Sulphite - |

Old Ni newf - 271-7645
 11 256 7607
 New Ni oldf - 250-7261
 250-7282

134 Old Ni Old flake
 K Sulphide (lums)

CO
 1st Run 193
 2 193 197
 3 200 220
 4 160 160
 5 493

187

New Ni old flake

1st Run

703

640

Old Ni newflake -

1st Run

135 Old Ni Newflake 1st Run
 Na Sulphate

533
 703
 707
 700

523
 702
 707
 697

New Ni Old flake

1st Run

963
 1103
 1152

977
 1117
 1173

Old Ni newflake

1st Run

Old Ni new fl 272 | 7360
250 | 7223

new Ni old f - 263 7512
254 7522

136 Old Ni New flake 7th Run
K formate 2nd

727 707
750 720
723 640
72

New Ni Old flake 1st Run

1010 997
1110 1120
1147 1153

Old Ni new flake - 1st Run

720 607

137 Old Ni Old flake 1st
Na ferrocyanide

New Ni Old flake 1st

Old Ni New flake 1st

138 Old Ni Old flakes 1st
Na Glycerophosphate

New Ni old flakes 1st

Old Ni new flakes 1st

139 Old Ni Old flakes 1st
Na Bromate

New Ni Old flakes 1st

Old Ni new flakes 1st

140 Old Ni Old Flake 1st
Paraaminobenzenesulphonate

1

2

New Ni Old Flake 1st

Old Ni New flc 1st

141 - Old Ni Old Flake 1st
Glucose

New Ni Old Flake 1st

Old Ni New Flake 1st

244-7097

260 7443

230 7108

125 old m. o. f

new m. o. f

old m. new f

126 - old m. o. f

new m. o. f

old m. new f

2nd R

3 "

4 "

2nd

2nd

2nd

2nd

673

788

787

747

1197

1183

1147

1223

671

747

747

747

833

810

770

787

1173

1173

1173

1217

820

800

770

767

673

1193

547

255-6938

268-7329

275-7329

249-7482

249-7482

124- old m old - 2nd 787
787
717
757

new m old - 2nd 1117
1100
1190
1133

old m newf 2nd 760
740
717
710

128- old m newf 1st 777 797
2 1 800 810
773 790
770 790

new m old f 1060 1050
1213 1177
1244 1240

old m newf

Made 500 grains old tube mix in
15% glycerum 3% KOH or NaOH -
got very green - washed
flake away - washed
frozen wall - dried & put

about oz in different
acids 3% Sol, only put
enough acid in to wet &
Cover $\frac{1}{8}$ to $\frac{1}{4}$ " deep -
left all night -

In morning only one
that showed abnormal

Note (acetic a
 phen a m m m
 also acetic & phosphorus
 acid mass large
 white mass
 from acetic acid
 alumina

Was acetic (line) ~~phosphorus~~ acetic
 Phosphorus are green Oxalic Boric Lanthan
~~green~~ + on shaking & col
~~green~~ but acetic black
 from black carbon Ni Y
 Prussian - Liquid filled
 a green & black carbon
 left on paper - filled
 slowly — all the
 others filled fast &
 normal —

I took out acids from green

Test like sample from Phosphoric
 acid mixed with Nitro gives large
 white precip with Nitro &
 acetic also same —

~~56~~ Ni given from 566 lat in
glycerol 0.5% alcohol —

This is the protein

Treated about 1/2 ~~proportion~~ 0.3 or
so with

- 3% Phosphoric
- " Acetic
- " Boric
- " Tartaric
- " Citric
- " Phenol
- " Oxalic

Put in the 3% sol on Ni just enough
to cover it & 1/8 more in 3" test tube
flask, left it all night & broken
off. Phenol no pp with ammon
or K₂Cr₂O₇, none with Tartaric
Boric Oxalic — phosphoric
was given Acetic into
Oxalic white — Acetic
Phenol gave very white
precipitate which also at
K₂Cr₂O₇ all the Ni of Ni
See 2 pages ahead

down off. use 100 grams
of Fe from old pockets,-

Break up to $\frac{1}{4}$ inch to $\frac{1}{8}$

+ Soak in all the solutions
you wanted it in. Soak
48 hours wash free dry
in air + put in cooked oil film

8387 292
8314 293 Dumps 29-40 dumps

| Run | 40 Hot | Hot | 171 | 1153 | 987 |
|--------|--------|------|-----|------|-----|
| 63 | 1173 | 847 | | | |
| 64 | 1153 | 1097 | | | |
| 65 | 1143 | 1097 | | | |
| 116 | 1153 | 883 | | | |
| 117 | 1200 | 977 | | | |
| 118 | 1210 | 1033 | | | |
| 119 | 1143 | 987 | | | |
| 120 | 1150 | 913 | | | |
| 8 | 129 | 276 | | | |
| 4 | 002 | 269 | | | |
| 40 Hot | | Hot | | | |
| 63 | 1000 | 1123 | | | |
| 64 | 1117 | 1110 | | | |
| 65 | 1108 | 1107 | | | |
| 116 | 1127 | 1127 | | | |
| 117 | 1190 | 1100 | | | |
| 118 | 1143 | 1160 | | | |
| 119 | 1160 | 1163 | | | |
| 120 | 570 | | | | |
| 7 | 774 | 254 | | | |

29.4 av. dump

100 Hot

30.3 av. dump

| Run | 40 Hot | Hot | 171 | 1193 | 1173 |
|-----|--------|------|-----|------|------|
| 63 | 1150 | 1100 | | | |
| 64 | 1127 | 1100 | | | |
| 65 | 1130 | 1097 | | | |
| 116 | 1203 | 883 | | | |
| 117 | 1163 | 1117 | | | |
| 118 | 1160 | 1180 | | | |
| 119 | 1180 | 1090 | | | |
| 120 | 1177 | 1133 | | | |

100 Hot

E
142-green barrel Carbolic

| Old Ni Newf- 10 Hot runs | 1st | 597 | 543 | 570 | 348 |
|-----------------------------|-----|------|------|------|-----|
| 1253-1190 | 2 | 943 | 893 | 910 | |
| 1223 1117 | 3 | 1037 | 1047 | 1067 | |
| 1213 1060 | 4 | 1147 | 1110 | 1120 | |
| | 5 | 1143 | 1107 | | |
| | 6 | 1160 | 1140 | | |
| | 7 | 1150 | 1127 | | |
| | 8 | 1177 | 1157 | | |
| | 9 | 1157 | 1143 | | |

E

143

| Old Ni Newf- 10 Hot runs | 1st | 517 | 550 | 533 | 333 |
|-----------------------------|-----|------|------|------|-----|
| 1227-1233 Hot 777 | 2nd | 843 | 890 | 866 | |
| 1173 1183 | 3 | 997 | 1017 | 1007 | |
| 1160 1163 | 4 | 1063 | 1070 | 1060 | |
| | 5 | 1060 | 1057 | | |
| | 6 | 1090 | 1090 | | |
| | 7 | 1077 | 1060 | | |
| | 8 | 1113 | 1090 | | |
| | 9 | 1093 | 1077 | | |

Baric

E

144

| Old Ni Newf- 10 Hot runs | 1st | 1450 | 1413 | 446 | 382 |
|-----------------------------|-----|------|------|------|-----|
| 1247-1200 Hot 710-720 | 2 | 817 | 840 | 828 | |
| 1157 1127 | 3 | 943 | 953 | 989 | |
| 1130 1127 | 4 | 1040 | 1090 | 1065 | |
| | 5 | 1033 | 1010 | | |
| | 6 | 1037 | 1017 | | |
| | 7 | 1030 | 997 | | |
| | 8 | 1063 | 1027 | | |
| | 9 | 1047 | 1010 | | |

Oxide

8548 302
6.605 297

40 ft Hat Rat

| | | | |
|-----|------|------|-----|
| 63 | 1117 | 1110 | 757 |
| 64 | 1117 | 1120 | 813 |
| 65 | 1107 | 1103 | |
| 116 | 1183 | 1147 | 773 |
| 117 | 1197 | 1210 | |
| 118 | 1207 | 1213 | 783 |
| 159 | 1140 | 1153 | 260 |
| 170 | 1170 | 1180 | |

100 ft Hat

25.6 per Camp

29.8 per Camp

171 1190 1200

40 ft Hat Rat

| | | | |
|-----|------|------|-----|
| 63 | 1133 | 1117 | 583 |
| 64 | 1130 | 1117 | 593 |
| 65 | 1127 | 1097 | |
| 116 | 1200 | 1200 | 853 |
| 117 | 1240 | 1240 | |
| 118 | 1247 | 1237 | 850 |
| 159 | 1223 | 1130 | 271 |
| 170 | 1247 | 1223 | |

100 ft Hat

29.00 per Camp

171 1247 1247

40 ft Hat Rat

| | | | |
|-----|------|------|-----|
| 63 | 1190 | 1000 | 900 |
| 64 | 1187 | 1133 | 850 |
| 65 | 1193 | 1147 | |
| 116 | 1000 | 1000 | 800 |
| 117 | 1247 | 1143 | |
| 118 | 1310 | 1193 | |
| 159 | 1267 | 1140 | 780 |
| 170 | 1283 | 1130 | |

100 ft Hat

171 1310 1157

E

gone on 10 Run Hat

145 - Green Winged Tanager -

Old N. Newf - 10 Hat

| | | | | |
|-----------|-----|------|------|-----|
| 145 | 453 | 507 | 480 | 327 |
| 1243-1267 | 2 | 787 | 807 | |
| 1160 1230 | 3 | 967 | 1007 | 180 |
| 1157 1200 | 4 | 1267 | 1090 | 91 |
| | 5 | 1077 | 1100 | |
| | 6 | 1117 | 1127 | |
| | 7 | 1087 | 1120 | |
| | 8 | 1143 | 1150 | |
| | 9 | 1117 | 1173 | |

E

146

Old N. Newf - 10 Hat

| | | | | |
|-----------|-----|------|------|------|
| 146 | 443 | 483 | 480 | 377 |
| 1210-1243 | 2 | 873 | 857 | 905 |
| 1157 1153 | 3 | 1013 | 1020 | 1016 |
| 1093 1127 | 4 | 1050 | 1030 | 1090 |
| | 5 | 1073 | 1077 | |
| | 6 | 1033 | 1023 | |
| | 7 | 1033 | 1020 | |
| | 8 | 1060 | 1040 | |
| | 9 | 1053 | 1073 | |

E

147

Old N. Newf - 10 Hat

| | | | | |
|-----------|-----|------|------|------|
| 147 | 590 | 590 | 590 | 327 |
| 1260-1200 | 2 | 923 | 903 | 913 |
| 1187 1133 | 3 | 1050 | 1020 | 1035 |
| 1173 1127 | 4 | 1093 | 1067 | 1080 |
| | 5 | 1073 | 1050 | |
| | 6 | 1097 | 1020 | |
| | 7 | 1047 | 1057 | |
| | 8 | 1110 | 1090 | |
| | 9 | 1100 | 1070 | |

gone on Hat Head

7590
7624

247
240

31.2 per drum

E
1488 green treated Phosphoric
Old M. roof - 1st 10, 13, 5 5
2 7 10 8 8
3 7 7
4 7 10
5th 7 7
6 7 10
7 7 7

Co -

all Feeds
120 mesh 5 grms - 42

| | 14549 | 14550 | 1E | 2E | 3E | 4E |
|----|--------------|-------------|--------------|--------------|-------------|--------------|
| 8 | 1250 1500 | 985 1290 | 1180 1790 | 1160 1810 | 975 1360 | 1160 1790 |
| 16 | 1725 1945 | 960 1315 | 1220 1940 | 1195 1940 | 950 1420 | 1175 1795 |
| 24 | 1180 1885 | 900 1255 | 1200 1910 | 1180 1855 | 960 1350 | 1135 1755 |
| 32 | 1150 1775 | 900 1280 | 1215 1910 | 1145 2370 | 920 1365 | 1050 1615 |
| 40 | 1135 1780 | 835 1155 | 1170 1655 | 1080 1650 | 840 1215 | 965 1460 |
| 48 | 1200 1570 | 875 1230 | 1155 1505 | 1075 1630 | 840 1260 | 945 1455 |
| 56 | 1090 1650 | 825 1190 | 1185 1575 | 1055 1715 | 900 1310 | 980 1500 |
| 64 | 1160 1750 | 835 1130 | 1150 1490 | 1010 1540 | 875 1230 | 885 1355 |
| 72 | 1180 1755 | 775 1165 | 1135 1755 | 1000 1475 | 825 1190 | 825 1250 |

Iron packets from 4 yr old
Cells washed & ground ~~and~~
through 120 mesh & sent to
Silver Lake to put in 5
gram packets —

There is about mixed 20% of very
fine 180 mesh mesh with 1/2 in. plate
account old from running out
of packets —

| SL 1924 | | Old 72 Coulmum | | 5 Lbs 1922 | |
|------------|-----------|-----------------|-----------|------------|------|
| 7 gram PKs | | 10 gram pockets | | | |
| SE | 6E | 7E | 8E | | |
| 8 | 645 590 | 1510 2440 | 2007 3313 | 1953 | 3206 |
| 16 | 1555 2485 | 1685 2830 | 2013 3186 | 1960 | 3066 |
| 24 | 1570 2495 | 1690 2830 | 2067 3347 | 1973 | 3173 |
| 32 | 1600 2500 | 1725 2860 | 2000 3200 | 1940 | 3090 |
| 40 | 1555 2475 | 1750 2850 | 1933 3160 | 1913 | 3047 |
| 48 | 1590 2475 | 1795 2880 | 1947 3267 | 1907 | 3090 |
| 56 | 1640 2570 | 1830 2940 | 1690 2720 | 1513 | 2400 |
| 64 | 1680 2525 | 1850 3005 | 1600 2595 | 1393 | 2267 |
| 72 | 1455 2230 | 1745 2750 | | | |

Evidently the iron comes out of
jackets - see 8 E 45 56 4 6 4 Run

Possibly explained by
following in CIDS on old
Greenberg's paper

Amidobenzonic Mela-Oxth Para

Amidosulphonic

Phenolsulphonic WNA - X

Anisic

Amidosulphonic

Bromic

Chloric

Butyric

Cisproic

Monochloroacetic

Chrysanthemic

Cinnamic

Cresolic Para, Ortho, Meta

Cyanacetic

Cyanuric

Isothionic

Rithalic

Maleic

Malic

Malonic

Naphthylaminesulphonic

Acids Continued

| | |
|-----------------|---|
| Perchloric | X |
| Phosphoric | X |
| Phosphotungstic | X |
| Phosphoric | X |
| Diphosphoric | X |
| Diazobenzene | |
| Diazobenzene | |
| Diphosphoric | |
| Diphosphoric | |
| Ethylacetic | |
| Ethylacetic | |
| Formic | |
| Gallie | |
| Glyceric | |
| Glycolic | |
| Heptonic | |
| Hydrochloric | |
| Hydrofluoric | |
| Hydrofluoric | |
| KCl | |

from Expts 142 To 148 - 148
shows that old is low especially
is due either to phosphates
Aluminates, Oxalates, Iron
or Ferrates,

There is very little Iron in
mix so ferrate is impossible
Aluminates + phosphates
is probably the trouble,
with possible Oxalates
or a Silicate,

The thing just now in view
of 148 is to provide a color
phosphoric acid ammonium
has been placed

I notice lot of Grows from old
pockets put in various places.
Some are fragile, others
just as strong as new -

The Most White powder from
Old 440 Nickel is broken out
by ~~the~~ Na formate

But the test in battery shows
925 max for cobalt in 10 max
for phosphorus -
formate may be better than
acetic acid, try it -

Phosphoric^{acid} is a big
phenomenon - phenomenon
makes M.O.H. most

Why 55
11

all Irons -

all on 230 run on Sunday
Monday washed, washed 4
times, total time 98 hours
before put out to dry -

All the old Irons
Couldnt load 5 gms
used 7. grams in
Packets -

10% need for mixed
used with all

149 to 172

May shot etc. desolved
boy took machine

Old Fe 4 yrs

149- 4 yr cell Iron

3% Tardis - No 149E

5 gram packet, iron

ground time 60 mesh

Miller adds 10% new iron thru 60 mesh

| | | | | | |
|-----|------|------|-----|----|-----------|
| Run | | | | | |
| 1 | 1570 | 1700 | | 11 | 1575 1600 |
| 2 | 1640 | 1775 | | 12 | 1515 1600 |
| 3 | 1600 | 1880 | | 13 | 1540 1625 |
| 4 | 1412 | 1437 | 750 | 14 | 1505 1525 |
| 5 | 1337 | 1375 | | 15 | 1410 1490 |
| 6 | 1187 | 1150 | | 16 | 1400 1500 |
| 7 | | | | 17 | 1585 1670 |
| 8 | 1688 | 1735 | | 18 | 1500 1545 |
| 9 | 1645 | 1810 | | 20 | 1600 1670 |
| 9 | 1850 | 1890 | | 21 | 1600 1690 |
| 10 | 1575 | 1610 | | | |

150, 3% Boric Acid -

| | No. 1 | No. 2 | | | | |
|----|-------|-------|-----|----|------|------|
| 1 | 1570 | 1500 | | 11 | 1520 | 1520 |
| 2 | 1600 | 1540 | | 12 | 1490 | 1490 |
| 3 | 1600 | 1495 | | 13 | 1575 | 1510 |
| 4 | 1187 | 1125 | 750 | 14 | 1450 | 1410 |
| 5 | 1212 | 1147 | | 15 | 1410 | 1390 |
| 6 | 112 | 1100 | | 16 | 1420 | 1400 |
| 7 | 1600 | 1600 | | 17 | 1610 | 1620 |
| 8 | 1695 | 1700 | | 18 | 1500 | 1500 |
| 9 | 1710 | 1750 | | 20 | 1600 | 1500 |
| 10 | 1575 | 1610 | | 21 | 1635 | 1645 |

Old Fe 4 yrs

151 3% Oxalic Acid

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1640 | 1700 | 11 | 1435 | 1475 |
| 2 | 1640 | 1700 | 12 | 1425 | 1470 |
| 3 | 1585 | 1665 | 13 | 1410 | 1520 |
| 4 | 1180 | 1480 | 14 | 1390 | 1445 |
| 5 | 1394 | 1400 | 15 | 1310 | 1315 |
| 6 | 1100 | 1200 | 16 | 1300 | 1400 |
| 7 | 1575 | 1600 | 17 | 1460 | 1580 |
| 8 | 1640 | 1750 | 18 | 1530 | 1525 |
| 9 | 1710 | 1770 | 19 | 1470 | 1555 |
| 10 | 1475 | 1545 | 20 | 1475 | 1560 |

Evidently phosphorus
acid don't hunt Iron
like it hunts Nickel

152^E 3% Phosphoric Acid

| 75% Phosphoric Acid | | | 75% Phosphoric Acid | | |
|---------------------|------|------|---------------------|------|------|
| 1 | 1890 | 2000 | 11 | 1590 | 1550 |
| 2 | 1860 | 1670 | 12 | 1570 | 1470 |
| 3 | 1900 | 1730 | 13 | 1600 | 1500 |
| 4 | 1412 | 1250 | 14 | 1490 | 1430 |
| 5 | 1400 | 1450 | 15 | 1440 | 1390 |
| 6 | 1225 | 1175 | 16 | 1460 | 1400 |
| 7 | 1775 | 1685 | 17 | 1630 | 1580 |
| 8 | 1900 | 1700 | 18 | 1500 | 1470 |
| 9 | 1895 | 1625 | 20 | 1620 | 1560 |
| 10 | 1635 | 1545 | 21 | 1650 | 1565 |

Old Fe 4 yrs

153^E 3% Acetic

| | | |
|----|------|------|
| 1 | 1570 | 1765 |
| 2 | 2000 | 1755 |
| 3 | 2080 | 1735 |
| 4 | 1437 | 1375 |
| 5 | 1225 | 1425 |
| 6 | 1275 | 1137 |
| 7 | 2050 | 1710 |
| 8 | 1970 | 1750 |
| 9 | 1945 | 1850 |
| 10 | 1680 | 1575 |

470

Handwritten note

Handwritten note

| | | |
|----|------|------|
| 11 | 1670 | 1580 |
| 12 | 1685 | 1520 |
| 13 | 1615 | 1550 |
| 14 | 1590 | 1490 |
| 15 | 1535 | 1450 |
| 16 | 1580 | 1475 |
| 17 | 1765 | 1645 |
| 18 | 1650 | 1525 |
| 19 | 1780 | 1665 |
| 20 | 1770 | 1650 |
| 21 | 1680 | 1585 |
| 22 | 1640 | 1550 |
| 23 | 1610 | 1510 |
| 24 | 1700 | 1585 |
| 25 | 1645 | 1520 |
| 26 | 1575 | 1480 |

Handwritten note

154^E 3% Hydrofluoric Acid

| | | |
|----|------|------|
| 1 | 1450 | 1250 |
| 2 | 1850 | 1700 |
| 3 | 1860 | 1700 |
| 4 | 1437 | 1287 |
| 5 | 1450 | 1212 |
| 6 | 1200 | 1050 |
| 7 | 1770 | 1635 |
| 8 | 1810 | 1690 |
| 9 | 1895 | 1715 |
| 10 | 1630 | 1535 |

750

Handwritten note

Handwritten note

| | | |
|----|------|------|
| 11 | 1600 | 1525 |
| 12 | 1575 | 1490 |
| 13 | 1625 | 1520 |
| 14 | 1500 | 1445 |
| 15 | 1470 | 1425 |
| 16 | 1480 | 1430 |
| 17 | 1645 | 1550 |
| 18 | 1540 | 1475 |
| 19 | 1630 | 1400 |
| 20 | 1650 | 1590 |
| 21 | 1650 | 15 |

G

156

49 1745 166A

| | | | |
|--------------------------------|---|------|------|
| 156 ¹ A = 2nd Run - | 1 | | |
| | 2 | 1790 | 1680 |
| | 3 | 1750 | 1665 |
| | 4 | 1700 | 1645 |
| | 5 | 1650 | 1690 |
| | 6 | 1660 | 1625 |

This is 156, run 7 grams but no
extra 10% rec. mixed in it

| | | |
|----|------|------|
| 7 | 1745 | 1675 |
| 11 | 1760 | 1750 |
| 12 | 1710 | 1700 |
| 15 | 1635 | 1645 |
| 16 | 1720 | 1750 |
| 17 | 1665 | 1650 |

Old Fe 4 yrs

155¹ Hydrofluoroacetic Acid

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1385 | 1690 | 11 | 1580 | 1515 |
| 2 | 1700 | 1650 | 12 | 1560 | 1435 |
| 3 | 525 | 1600 | 13 | 1590 | 1420 |
| 4 | 437 | 1287 | 14 | 1460 | 1350 |
| 5 | 975 | 1225 | 15 | 1425 | 1305 |
| 6 | 612 | 1025 | 16 | 1400 | 1250 |
| 7 | 1710 | 1635 | 17 | 1500 | 1400 |
| 8 | 1760 | 1650 | 18 | 1525 | 1400 |
| 9 | 1650 | 1525 | 20 | 1570 | 1400 |
| 10 | 1600 | 1575 | 21 | 1565 | 1400 |

156² Dithionous Acid

| | | | | | |
|----|------|------|----|------|------|
| 11 | 1865 | 1860 | 11 | 1900 | 1900 |
| 2 | 1950 | 1860 | 12 | 1835 | 1860 |
| 3 | 1900 | 1800 | 13 | 1850 | 1850 |
| 4 | 1425 | 1500 | 14 | 1815 | 1830 |
| 5 | 1425 | 1500 | 15 | 1795 | 1820 |
| 6 | 1425 | 1500 | 16 | 1790 | 1820 |
| 7 | 1965 | 1970 | 17 | 1860 | 1910 |
| 8 | 1980 | 1980 | 18 | 1845 | 1900 |
| 9 | 2125 | 2100 | 20 | 1900 | 1930 |
| 10 | 1890 | 1890 | 21 | 1900 | 1930 |
| | | | 22 | 1865 | 1875 |
| | | | 24 | 1800 | 1860 |
| | | | 25 | 1790 | 1830 |
| | | | 26 | 1850 | 1895 |
| | | | 27 | 1825 | 1855 |
| | | | 28 | 1790 | 1835 |

Old Fz 4 yrs

157 E Arsenic Acid 3%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1900 | 1925 | 11 | 1625 | 1630 |
| 2 | 1870 | 1870 | 12 | 1570 | 1570 |
| 3 | 1800 | 1855 | 13 | 1600 | 1600 |
| 4 | 1450 | 1437 | 14 | 1490 | 1500 |
| 5 | 1475 | 1462 | 15 | 1440 | 1480 |
| 6 | 1237 | 1237 | 16 | 1450 | 1480 |
| 7 | 1800 | 1800 | 17 | 1530 | 1585 |
| 8 | 1810 | 1810 | 18 | 1500 | 1500 |
| 9 | 1955 | 1960 | 19 | 1625 | 1600 |
| 10 | 1635 | 1640 | 20 | 1595 | 1595 |
| | | | 21 | 1590 | 1530 |
| | | | 22 | 1510 | 1505 |
| | | | 23 | 1500 | 1500 |

158 E Phosphotungstic Acid 3%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1865 | 1875 | 11 | 1570 | 1580 |
| 2 | 1785 | 1885 | 12 | 1580 | 1580 |
| 3 | 1700 | 1955 | 13 | 1625 | 1625 |
| 4 | 1450 | 1437 | 14 | 1500 | 1490 |
| 5 | 1462 | 1212 | 15 | 1460 | 1440 |
| 6 | 1187 | 1250 | 16 | 1490 | 1460 |
| 7 | 1765 | 2040 | 17 | 1670 | 1635 |
| 8 | 1900 | 1930 | 18 | 1625 | 1600 |
| 9 | 1850 | 1895 | 19 | 1665 | 1670 |
| 10 | 1615 | 1640 | 20 | 1690 | 1650 |
| | | | 21 | 1555 | 1535 |
| | | | 22 | 1510 | 1500 |
| | | | 23 | 1510 | 1460 |

Old Fz 4 400

159^{6P} Phosphomolybdic acid 3%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1965 | 1775 | 11 | 1700 | 1470 |
| 2 | 1885 | 1685 | 12 | 1685 | 1435 |
| 3 | 1900 | 300 | 13 | 1700 | 1460 |
| 4 | 1425 | 187 | 14 | 1615 | 1400 |
| 5 | 1425 | 625 | 15 | 1575 | 1345 |
| 6 | 1275 | 750 | 16 | 1575 | 1325 |
| 7 | 1865 | 1565 | 17 | 1740 | 1520 |
| 8 | 1940 | 1670 | 18 | 1690 | 1370 |
| 9 | 1970 | 1650 | 20 | 1770 | 1570 |
| 10 | 1700 | 1470 | 21 | 1770 | 1560 |
| | | | 22 | 1655 | 1425 |
| | | | 23 | 1585 | 1335 |
| | | | 24 | 1610 | 1355 |
| | | | 25 | 1655 | 1440 |
| | | | 26 | 1655 | 1440 |
| | | | 27 | 1600 | 1370 |
| | | | 28 | 1525 | 1300 |

Calculation

160⁸ Trichloroacetic Acid 3%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1870 | 1875 | 11 | 1580 | 1575 |
| 2 | 1770 | 1940 | 12 | 1540 | 1575 |
| 3 | 1700 | 1970 | 13 | 1550 | 1600 |
| 4 | 1425 | 1362 | 14 | 1460 | 1470 |
| 5 | 1312 | 1237 | 15 | 1790 | 1425 |
| 6 | 1212 | 1312 | 16 | 1400 | 1400 |
| 7 | 1720 | 2045 | 17 | 1600 | 1575 |
| 8 | 1800 | 1970 | 18 | 1500 | 1450 |
| 9 | 1895 | 1590 | 20 | 1630 | 1575 |
| 10 | 1600 | 1640 | 21 | 1600 | 1575 |
| | | | 22 | | |

Calculation

Old to 4 yrs

16% Formic Acid 3%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1790 | 1575 | 11 | 1595 | 1425 |
| 2 | 1700 | 1565 | 12 | 1580 | 1400 |
| 3 | 80 | 1500 | 13 | 1615 | 1410 |
| 4 | 1225 | 1437 | 14 | 1470 | 1350 |
| 5 | 1225 | 587 | 15 | 1440 | 1310 |
| 6 | 1250 | 917 | 16 | 1460 | 1300 |
| 7 | 2000 | 1460 | 17 | 1630 | 1465 |
| 8 | 1910 | 1580 | 18 | 1500 | 1325 |
| 9 | 1815 | 1575 | 19 | 1670 | 1470 |
| 10 | 1615 | 1430 | 20 | 1565 | 1490 |

Handwritten notes: "Handwritten notes" and "C. C. C."

16% Salicylic Acid 1/4 %

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1985 | 1990 | 11 | 1700 | 1710 |
| 2 | 1900 | 1950 | 12 | 1695 | 1700 |
| 3 | 1895 | 1900 | 13 | 1700 | 1740 |
| 4 | 1500 | 1450 | 14 | 1585 | 1620 |
| 5 | 1462 | 1450 | 15 | 1580 | 1570 |
| 6 | 1250 | 1175 | 16 | 1575 | 1620 |
| 7 | 1875 | 1900 | 17 | 1735 | 1700 |
| 8 | 1900 | 1810 | 18 | 1700 | 1700 |
| 9 | 1995 | 1985 | 19 | 1750 | 1800 |
| 10 | 1700 | 1710 | 20 | 1760 | 1780 |
| | | | 21 | 1675 | 1710 |
| | | | 22 | 1615 | 1660 |
| | | | 23 | 1600 | 1645 |
| | | | 24 | 1700 | 1720 |
| | | | 25 | 1630 | 1670 |
| | | | 26 | 1575 | 1600 |

Handwritten notes: "Handwritten notes" and "C. C. C."

Plate 4 yrs

163E Benzoic Acid 1/4%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1615 | 1800 | 11 | 1450 | 1550 |
| 2 | 1650 | 1750 | 12 | 1440 | 1550 |
| 3 | 1600 | 1700 | 13 | 1460 | 1525 |
| 4 | 1250 | 1375 | 14 | 1440 | 1465 |
| 5 | 1212 | 1412 | 15 | 1385 | 1425 |
| 6 | 1137 | 1187 | 16 | 1370 | 1435 |
| 7 | 1640 | 1685 | 17 | 1540 | 1585 |
| 8 | 1675 | 1730 | 18 | 1520 | 1580 |
| 9 | 1715 | 1820 | 19 | 1555 | 1600 |
| 10 | 1485 | 1590 | 20 | 1555 | 1600 |
| | | | 21 | 1555 | 1600 |
| | | | 22 | | |

164E Para Cresylic 2%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1800 | 250 | 11 | 1530 | 1550 |
| 2 | 1700 | 250 | 12 | 1550 | 1580 |
| 3 | 1630 | 1800 | 13 | 1620 | 1620 |
| 4 | 1425 | 1225 | 14 | 1490 | 1525 |
| 5 | 1425 | 862 | 15 | 1460 | 1460 |
| 6 | 1225 | 1262 | 16 | 1470 | 1460 |
| 7 | 1725 | 1900 | 17 | 1635 | 1625 |
| 8 | 1770 | 1920 | 18 | 1540 | 1550 |
| 9 | 1860 | 1900 | 19 | 1675 | 1635 |
| 10 | 1580 | 1640 | 20 | 1675 | 1635 |
| | | | 21 | 1645 | 1650 |

Old 4. 445

165E MetaCresylic Acid 2%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1970 | 1900 | 11 | 1700 | 1675 |
| 2 | 1900 | 1800 | 12 | 1655 | 1645 |
| 3 | 1900 | 1795 | 13 | 1700 | 1700 |
| 4 | 1460 | 1487 | 14 | 1595 | 1595 |
| 5 | 1450 | 1462 | 15 | 1565 | 1565 |
| 6 | 1225 | 1250 | 16 | 1590 | 1585 |
| 7 | 1875 | 1875 | 17 | 1760 | 1750 |
| 8 | 1920 | 1870 | 18 | 1690 | 1690 |
| 9 | 1990 | 1945 | 20 | 1780 | 1875 |
| 10 | 1710 | 1675 | 21 | 1785 | 1845 |
| | | | 22 | 1695 | 1710 |
| | | | 24 | 1625 | 1625 |
| | | | 25 | 1610 | 1610 |
| | | | 26 | 1705 | 1705 |
| | | | 27 | 1635 | 1635 |

166E Ortho Cresylic Acid 2%

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1900 | 1590 | 11 | 1675 | 1710 |
| 2 | 1870 | 1600 | 12 | 1620 | 1475 |
| 3 | 1860 | 1600 | 13 | 1660 | 1465 |
| 4 | 1500 | 1312 | 14 | 1555 | 1415 |
| 5 | 1475 | 1250 | 15 | 1580 | 1400 |
| 6 | 1250 | 1212 | 16 | 1520 | 1410 |
| 7 | 1850 | 1600 | 17 | 1700 | 1560 |
| 8 | 1860 | 1675 | 18 | 1680 | 1490 |
| 9 | 1960 | 1760 | 20 | 1740 | 1600 |
| 10 | 1670 | 1500 | 21 | 1720 | 1600 |
| | | | 22 | 1635 | 1525 |
| | | | 24 | 1585 | 1500 |
| | | | 25 | 1645 | 1585 |
| | | | 26 | 1690 | 1490 |
| | | | 27 | 1490 | 1490 |

Chy 400 mat
 Dschy 300 ma
 CCC. brown
 home

Olaf 4 yrs

| 467 E Picric Acid 3% | | | | | |
|----------------------|------|------|----|------|------|
| 1 | 1800 | 1890 | 11 | 1600 | 1700 |
| 2 | 1760 | 1880 | 12 | 1550 | 1650 |
| 3 | 1700 | 1850 | 13 | 1530 | 1700 |
| 4 | 1362 | 1420 | 14 | 1470 | 1600 |
| 5 | 1250 | 1437 | 15 | 1400 | 1550 |
| 6 | 1225 | 1275 | 16 | 1400 | 1590 |
| 7 | 1125 | 1465 | 17 | 1565 | 1750 |
| 8 | 1160 | 1900 | 18 | 1450 | 1600 |
| 9 | 1865 | 1975 | 20 | 1635 | 1755 |
| 10 | 1580 | 1705 | 21 | 1650 | 1780 |

| 168 E Hydrochloric Acid - 2% | | | | | |
|------------------------------|------|------|----|------|------|
| 1 | 1725 | 1800 | 11 | 1695 | 1630 |
| 2 | 1795 | 1750 | 12 | 1625 | 1545 |
| 3 | 1875 | 1760 | 13 | 1670 | 1630 |
| 4 | 1425 | 1375 | 14 | 1580 | 1540 |
| 5 | 1150 | 1487 | 15 | 1535 | 1515 |
| 6 | 1200 | 1250 | 16 | 1540 | 1535 |
| 7 | 1980 | 1730 | 17 | 1700 | 1740 |
| 8 | 1960 | 1810 | 18 | 1605 | 1620 |
| 9 | 1860 | 1900 | 20 | 1755 | 1745 |
| 10 | 1635 | 1615 | 21 | 1800 | 1765 |
| | | | 22 | 1685 | 1675 |
| | | | 23 | 1600 | 1620 |
| | | | 24 | 1550 | 1585 |
| | | | 25 | 1650 | 1600 |
| | | | 26 | 1630 | 1600 |
| | | | 27 | 1530 | 1600 |

Old 72 440

169⁶ Chromic Acid 3%

| | | |
|----|-----|------|
| 1 | 910 | 900 |
| 2 | 935 | 1025 |
| 3 | 650 | 970 |
| 4 | 225 | 525 |
| 5 | 550 | 575 |
| 6 | 562 | 662 |
| 7 | 950 | 1125 |
| 8 | 880 | 940 |
| 9 | 910 | 1020 |
| 10 | 885 | 945 |

| | | |
|----|-----|-----|
| 11 | 870 | 930 |
| 12 | 875 | 920 |
| 13 | 860 | 890 |
| 14 | 850 | 840 |
| 15 | 810 | 830 |
| 16 | 820 | 900 |
| 17 | 840 | 874 |
| 19 | 850 | 900 |
| 20 | 835 | 895 |

C

170⁶ Carbonic Acid 3%

| | | |
|----|------|------|
| 1 | 1730 | 1690 |
| 2 | 1800 | 1765 |
| 3 | 1690 | 1670 |
| 4 | 1190 | 1087 |
| 5 | 1212 | 1150 |
| 6 | 1212 | 1225 |
| 7 | 1890 | 1890 |
| 8 | 1635 | 1650 |
| 9 | 1675 | 1700 |
| 10 | 1590 | 1600 |

| | | |
|----|------|------|
| 11 | 1495 | 1575 |
| 12 | 1550 | 1600 |
| 13 | 1480 | 1480 |
| 14 | 1455 | 1465 |
| 15 | 1440 | 1500 |
| 16 | 1570 | 1600 |
| 17 | 1490 | 1540 |
| 19 | 1600 | 1640 |
| 21 | 1600 | 1655 |

C

Carbonic

Old 4 y

171 Citric Acid 3%

| | | |
|----|------|------|
| 1 | 1700 | 1700 |
| 2 | 1830 | 1820 |
| 3 | 1700 | 1700 |
| 4 | 1125 | 1175 |
| 5 | 1212 | 1275 |
| 6 | 1262 | 1312 |
| 7 | 1965 | 1975 |
| 8 | 1725 | 1760 |
| 9 | 1670 | 1720 |
| 10 | 1680 | 1650 |

| | | |
|----|------|------|
| 11 | 1585 | 1625 |
| 12 | 1610 | 1630 |
| 13 | 1475 | 1520 |
| 14 | 1435 | 1535 |
| 15 | 1425 | 1500 |
| 16 | 1640 | 1700 |
| 17 | 1520 | 1580 |
| 18 | 1645 | 1700 |
| 20 | 1660 | 1745 |

172 Nitric Acid 2%

| | | |
|----|------|------|
| 1 | 1700 | 1635 |
| 2 | 1725 | 1600 |
| 3 | 1590 | 1500 |
| 4 | 1087 | 1062 |
| 5 | 1075 | 1050 |
| 6 | 1125 | 1100 |
| 7 | 1550 | 1735 |
| 8 | 1585 | 1460 |
| 9 | 1630 | 1570 |
| 10 | 1495 | 1430 |

| | | |
|----|------|------|
| 11 | 1480 | 1400 |
| 12 | 1405 | 1400 |
| 13 | 1360 | 1355 |
| 14 | 1325 | 1335 |
| 15 | 1300 | 1315 |
| 16 | 1420 | 1430 |
| 17 | 1325 | 1400 |
| 18 | 1400 | 1470 |
| 20 | 1450 | 1475 |

Dried 173 to 177 all night
and temp. + 5 was on heat
plate in the corner.

Acetic was only one
that gave off steam -
seemed to hold water +
dry slow -

Old Ni + 400

173E Saturated Phenol in Water

| | | | | | | |
|-----------------|------|------|-----|----|------|------|
| 1 st | 617 | 633 | 1/4 | 24 | 7547 | 2500 |
| 2 | 987 | 1000 | | | 7510 | 2440 |
| 3 | 1047 | 1047 | | | | |
| 4 | 1043 | 1047 | | | | |
| 5 | 1020 | 1017 | | | | |
| 6 | 1027 | 1037 | | | | |
| 7 | 1033 | 1047 | | | | |
| 8 | 1037 | 1043 | | | | |

| | | |
|----|-----|-----|
| 19 | 963 | 937 |
| 20 | 940 | 890 |
| 21 | 900 | 820 |
| 23 | 877 | 833 |

Co

10 Hot

230 - 231

I now work them in Conc. CoCl after reaction from
Smith. See back 2

174E Formic Acid exp

| | | |
|---|------|------|
| 1 | 1100 | 1107 |
| 2 | 1153 | 1157 |
| 3 | 1113 | 1117 |
| 4 | 1100 | 1100 |
| 5 | 1070 | 1073 |
| 6 | 1090 | 1040 |
| 7 | 1100 | 1100 |
| 8 | 1103 | 1103 |

| | | |
|----|-----|------|
| 19 | 997 | 1003 |
| 20 | 967 | 953 |
| 21 | 930 | 915 |
| 23 | 900 | 917 |

10 Hot

232 - 233

I now work them in Conc. CoCl after reaction
from Smith. See back 2

Much colloid, filtering very slow on account of Colloid running thru filter - Acetic alone has this feature, phenol a little. phenol in alcohol more than phenol in water - As these are test must be some significance in it, =

Washed with Denat Alcohol all away then no color -

Old No 4 yr cell

175 Acetic Acid 6%

| | | | | | |
|---|------|------|-------|-----|---|
| 1 | 1123 | 1117 | 7 775 | 266 | C |
| 2 | 1170 | 1186 | 7 854 | 259 | |
| 3 | 1150 | 1097 | | | |
| 4 | 1127 | 1090 | 19- | 940 | |
| 5 | 1083 | 1050 | 20 | 950 | C |
| 6 | 1107 | 1053 | 21 | 913 | |
| 7 | 1117 | 1067 | 23 | 843 | |
| 8 | 1117 | 1067 | | 887 | |

Net 10

176 Phenol in Alcohol 12%

| | | | | | |
|---|------|------|-------|-----|---|
| 1 | 847 | 860 | 7 277 | 259 | C |
| 2 | 1035 | 1047 | 7 247 | 255 | |
| 3 | 1070 | 1010 | | | |
| 4 | 1047 | 1000 | 19- | 890 | |
| 5 | 1040 | 973 | 20 | 883 | C |
| 6 | 1050 | 943 | 21 | 860 | |
| 7 | 1060 | 1000 | 23 | 830 | |
| 8 | 1053 | 1000 | | 833 | |

10th at

236-237

I now soak in Conc Col buffer section from South. rec Sec 2

This is even more colloidal than
 Caotic or gelatin -
 It colloids coming from the
 Ni and running through filter
 when wash it clear & finally
 filtered then pyrophosphate
 of Soda will be good.

Potassium Citrate -
 wash water quite
 Colloid -

177. Saturated Soda Pyrophosphate.

| | | | | | |
|---|------|------|----|-----|-----|
| 1 | 1097 | 1077 | 7 | 530 | 262 |
| 2 | 1130 | 1110 | 7 | 528 | 256 |
| 3 | 1090 | 1067 | | | |
| 4 | 1080 | 1067 | 19 | 950 | 973 |
| 5 | 1047 | 1013 | 20 | 930 | 913 |
| 6 | 1067 | 1043 | 21 | 893 | 877 |
| 7 | 1077 | 1057 | 23 | 877 | 853 |
| 8 | 1043 | 1057 | | | |

180 at

C

How -

178 - Miller Mixes with 10%
Iron Mix 10% of seed crop
then 150 @ 130 mesh to keep
view from condensing to almost
a solid by action of the fig.

filtrate, light green.

filtrate not green
 faint wash water a little (colored)

179E Tartaric Acid 3%

| | | | | |
|---|------|------|-------|-----|
| 1 | 0 | 0 | 7 170 | 251 |
| 2 | 1020 | 1030 | 7 170 | 242 |
| 3 | 1033 | 1043 | | |
| 4 | 958 | 983 | | |
| 5 | 1110 | 1113 | | |
| 6 | 1117 | 1017 | | |
| 7 | 1013 | 1013 | | |

10 Hot

| | | |
|----|-----|-----|
| 19 | 893 | 910 |
| 20 | 857 | 893 |
| 21 | 857 | 852 |
| 22 | 800 | 837 |

G

180E Phosphoric Acid 3%

| | | | | |
|---|-----|-----|-------|-----|
| 1 | 227 | 627 | 6,985 | 238 |
| 2 | 160 | 100 | 7009 | 232 |
| 3 | 53 | 10 | | |
| 4 | 23 | 7 | | |
| 5 | 13 | 7 | | |
| 6 | 10 | -3 | | |
| 7 | 10 | 3 | | |

10 Hot

| | | |
|----|-----|----|
| 18 | 200 | 78 |
| 19 | 370 | 3 |
| 20 | 303 | 0 |
| 22 | 170 | 0 |

G

After soaking Sat Sunday -
 Coarse water f. mal Very
 Colloid - This acid seems to
 require time to give colloidal
 water - Most Colloidal
 yet if this turns out good it
 will more time, 2 or 3 days
 in acid 4 or 5 days or more -

faint Colloid in final coarse
 water -

181 E Hydrofluoric Acid 3%

| | | |
|-----|------|------|
| 1st | 260 | 567 |
| 2 | 933 | 1117 |
| 3 | 1120 | 1117 |
| 4 | 1097 | 1067 |
| 5 | 1117 | 1087 |
| 6 | 1127 | 1087 |
| 7 | 1113 | 1067 |

7549 270
 7510 262

| | | |
|----|-----|-----|
| 18 | 970 | 960 |
| 19 | 967 | 957 |
| 20 | 937 | 917 |
| 22 | 927 | 897 |

G

1067

182 E Hydrofluoric Acid -

| | | |
|-----|-----|------|
| 1st | 977 | 850 |
| 2 | 967 | 1190 |
| 3 | 960 | 953 |
| 4 | 917 | 927 |
| 5 | 937 | 967 |
| 6 | 917 | 967 |
| 7 | 980 | 977 |

7250 253
 7283 248

| | | |
|----|-----|-----|
| 18 | 923 | 600 |
| 19 | 910 | 957 |
| 20 | 870 | 857 |
| 22 | 847 | 853 |

1067

Very light green

Not green - after wash & soak
all night. Calcium comes twice
first filtering - even stronger
than Phosphotungstic -

183E Sulphurous Acid 3%

| | | | | |
|---|------|------|---------|-----|
| 1 | 1173 | 1133 | 7 618 | 273 |
| 2 | 1183 | 1000 | 7 574 | 264 |
| 3 | 1167 | 1120 | | |
| 4 | 1100 | 1057 | 18 973 | 997 |
| 5 | 1147 | 1103 | 19 1010 | 977 |
| 6 | 1143 | 1107 | 20 993 | 952 |
| 7 | 1130 | 1090 | 22 993 | 903 |

10 Hot

C
H₂SO₄

184E Arsenic Acid 3%

| | | | | |
|---|------|-----|--------|-----|
| 1 | 967 | 950 | 7 262 | 255 |
| 2 | 977 | 997 | 7 175 | 244 |
| 3 | 1000 | 980 | | |
| 4 | 950 | 917 | 18 947 | 883 |
| 5 | 1010 | 997 | 19 917 | 873 |
| 6 | 1020 | 987 | 20 897 | 870 |
| 7 | 1023 | 980 | 22 843 | 820 |

10 Hot

Colloid comes thru -
 Hard to letter - after wash & see
 little colloid

Very faint trace green

185E Phosphotungstate Acid 3%
 1 1033 997 7319 256
 2 1083 1000 7246 249
 3 1047 980
 4 990 920

| | | | | | |
|---|------|-----|----|-----|-----|
| 5 | 1053 | 993 | 18 | 920 | 867 |
| 6 | 1053 | 987 | 19 | 910 | 897 |
| 7 | 1060 | 983 | 20 | 887 | 855 |
| | | | 22 | 873 | 830 |

10th lot

G

186E Phosphomolybdate Acid 3%
 1 1057 1023 7222 264
 2 1027 620 7236 255
 3 1073 1037
 4 953 947

| | | | | | |
|---|------|-----|----|-----|-----|
| 5 | 1017 | 950 | 18 | 577 | 597 |
| 6 | 1023 | 990 | 19 | 860 | 803 |
| 7 | 1020 | 987 | 20 | 823 | 843 |
| | | | 22 | 800 | 817 |

10th lot

G

White ferrule

187 E Trichloroacetic Acid 3%

| | | | | | |
|---|------|------|----|-----|-----|
| 1 | 1147 | 1157 | 7 | 273 | 257 |
| 2 | 1177 | 1156 | 7 | 251 | 252 |
| 3 | 1133 | 1097 | | | |
| 4 | 1067 | 1050 | 18 | 963 | 973 |
| 5 | 1123 | 1077 | 19 | 927 | 940 |
| 6 | 1117 | 1083 | 20 | 893 | 910 |
| 7 | 1093 | 1077 | 22 | 877 | 953 |

10 Hot

White ferrule -

188 E Salicylic Acid 1/4%

| | | | | | |
|---|------|------|----|-----|------|
| 1 | 1107 | 1150 | 7 | 206 | 261 |
| 2 | 1147 | 1150 | 7 | 251 | 252 |
| 3 | 1110 | 1117 | | | |
| 4 | 1043 | 1060 | 18 | 970 | 1040 |
| 5 | 1080 | 1083 | 19 | 940 | 1017 |
| 6 | 1083 | 1090 | 20 | 910 | 927 |
| 7 | 1077 | 1080 | 22 | 873 | 950 |

10 Hot

White -

White

189 E Bengalic Cleid $\frac{1}{4}$ 1

| | | | | |
|-----------------|------|------|------|------|
| 1 st | 1160 | 1143 | 7410 | 259 |
| 2 | 1100 | 1110 | 7390 | 259 |
| 3 | 1123 | 1113 | | |
| 4 | 1063 | 1053 | | |
| 5 | 1100 | 1087 | 18 | 1030 |
| 6 | 1107 | 1087 | 19 | 1000 |
| 7 | 1077 | 1080 | 20 | 950 |
| | | | 22 | 937 |

Co

10th at

190 E Paria (Geologic Cleid) 2nd

| | | | | |
|-----------------|------|------|------|-----|
| 1 st | 183 | 700 | 7262 | 254 |
| 2 | 177 | 1050 | 7253 | 242 |
| 3 | 1047 | 1017 | | |
| 4 | 990 | 950 | 18 | 970 |
| 5 | 1027 | 977 | 19 | 907 |
| 6 | 1027 | 983 | 20 | 857 |
| 7 | 1010 | 1067 | 22 | 853 |

Co

10th at

no green.

1904 all before sent to S.B. & Co May 18 1914.

1914 Picnic acid ~~1 1/2~~

| | | | | | | |
|-----------------|------|------|----|------|--------|-----|
| 1 st | 727 | 1123 | | | 7.230 | 243 |
| 2 nd | 1083 | 1150 | | | 7.235- | 259 |
| 3 rd | 1157 | 1057 | | | | |
| 4 | 1067 | 1033 | 18 | 1020 | 1003 | |
| 5 | 1107 | 1067 | 19 | 960 | 967 | |
| 6 | 1110 | 1067 | 20 | 901 | 917 | |
| 7 | 1037 | 1067 | 22 | 913 | 933 | |

1066 at

1920 Re new green in 3 1/2% phosphoric acid

| | | | | | | |
|-----------------|------|------|------|------|------|-------|
| 1 st | 950 | 967 | | | 7276 | 242 D |
| 2 nd | 1143 | 1126 | | | 7290 | 254 - |
| 3 | 1173 | 1143 | at H | | | |
| 4 | 1223 | 1190 | 24 | 1247 | 1240 | |
| 5 | 1223 | 1247 | 25 | 1167 | 1200 | |
| 6 | 1227 | 1263 | 26 | 800 | 1173 | |
| 7 | 1277 | 1317 | | | | |
| 8 | 1277 | 1273 | | | | |
| 9 | 1293 | 1280 | 678 | 1220 | 1233 | |
| 10 | 1327 | 1283 | 68 | — | 1133 | |
| 11 | 1330 | 1190 | 69 | 1357 | 1163 | |
| 12 | 1333 | 1267 | 120 | 1191 | 1050 | |
| 13 | 1313 | 1240 | 121 | 1307 | 1060 | |
| | | | 122 | 1307 | 1163 | |

406 at

Schedule run on
Reg Varnish plates to
get rid of ~~excess~~ ~~excess~~ ~~excess~~ to
Condense hard enough to
stop Birds —

Monday 120 - 1 hour to search 1307

One hour more to search 140

Held at 140 for 3 hours —

Took one hour to search 225

Held one hour at 225 —

Took them out at 225 right — the
air — 1 Rich no plates really

~~There should be some way to
check on~~

Transfer

OK!!! —

This schedule seems ok no
blunders or any delays —

Took some mix from 4 yr cells
reduced by Na Hypsulphite ~~and~~
+ analysed it -

| | |
|--------------------|------------------|
| Silica- | 0.065% |
| Iron oxide | 0.29 |
| Alumina | 0.11 |
| Lime | 0.022 |
| Sulphate as SO_3 | 0.077 |
| Phosphate | Very small trace |
| Insoluble in acids | 0.017. |

This is 6 milg ^{Al₂O₃} per long tube
- A4 -

193

| | | |
|-----|------|------|
| 121 | 1177 | 1150 |
| 122 | 1167 | 1140 |

194

| | | |
|-----|------|------|
| 121 | 1160 | 1153 |
| 122 | 1217 | 1147 |

193E

| | | |
|-----|------|------|
| 150 | 1027 | 1037 |
| 2 | 1166 | 1167 |
| 3 | 1123 | 1123 |
| 4 | 1150 | 1157 |
| 5 | 1183 | 1157 |
| 6 | 1157 | 1150 |
| 7 | 1185 | 1173 |
| 8 | 1177 | 1167 |
| 9 | 1190 | 1180 |
| 10 | 1200 | 1190 |
| 11 | 1200 | 1900 |
| 12 | 1190 | 1193 |
| 13 | 1170 | 1163 |

194E

| | | |
|-----|------|------|
| 150 | 1150 | 1100 |
| 2 | 1223 | 1210 |
| 3 | 1177 | 1160 |
| 4 | 1217 | 1187 |
| 5 | 1227 | 1210 |
| 6 | 1207 | 1173 |
| 7 | 1227 | 1210 |
| 8 | 1223 | 1210 |
| 9 | 1280 | 1267 |
| 10 | 1297 | 1263 |
| 11 | 1323 | 1290 |
| 12 | 1320 | 1297 |
| 13 | 1317 | 1277 |

New green

formic acid 6%

7366 274
after heat of 331 265

| | | |
|----|------|------|
| 24 | 1283 | 1277 |
| 25 | 1153 | 1220 |
| 26 | 1177 | 1177 |
| - | 406 | 406 |

| | | |
|-----|------|------|
| 67 | 1280 | 1197 |
| 68 | 1163 | 1127 |
| 69 | 1117 | 1140 |
| 120 | 1243 | 1200 |

New green

with 40% formic acid

7400 260
after heat of 380 245

| | | |
|----|------|------|
| 24 | 1327 | 1333 |
| 25 | 1247 | 1253 |
| 26 | 1203 | 1246 |

406

| | | |
|----|------|------|
| 67 | 1327 | 1290 |
| 68 | 1210 | 1190 |
| 69 | 1220 | 1200 |

| | | |
|-----|------|------|
| 120 | 1240 | 1197 |
| 121 | 1240 | 1197 |
| 122 | 1240 | 1197 |

NOTE

As the acid combined with
the NaOH - & water didn't
wash it out, its probable
when put in cell, it,
swelled or changed so
it wouldn't Run -

Should use NaOH after
the treatment & wash
free & dry

| 195E | | Newgreen | |
|------|----|--------------------|----------|
| | | Phosphoric Acid 3% | |
| 1 | 83 | 33 | 7082 254 |
| 2 | 18 | 17 | 7087 241 |
| 3 | 0 | 0 | |
| 4 | 0 | 0 | |
| 5 | 0 | 0 | |
| 6 | 0 | 0 | |
| 7 | 3 | 3 | |
| 8 | 3 | 3 | CO |
| 9 | 0 | 0 | CO |

| 196E | | old m | |
|------|---|--------------------------|-----------|
| | | Potassium lactophosphate | |
| 1 | 3 | 3 | 7066 233 |
| 2 | 3 | 3 | 61942 230 |
| 3 | 3 | 3 | |
| 4 | 3 | 10 | |
| 5 | 0 | 10 | |
| 6 | 0 | 10 | CO |
| 7 | 0 | 0 | CO |

| 197 E Potassium Nitrite | | | | | |
|-------------------------|------|------|------|-----|-----|
| 1 | 1113 | 1118 | 7292 | | 241 |
| 2 | 1107 | 1100 | 7262 | | 240 |
| 3 | 1087 | 1067 | 22 | 993 | 990 |
| 4 | 1057 | 1053 | 23 | 900 | 893 |
| 5 | 1047 | 1030 | 24 | 923 | 933 |
| 6 | 1017 | 1000 | | | |
| 7 | 1033 | 1013 | | | |
| 8 | 1030 | 1003 | | | |
| 9 | 1037 | 1020 | | | |
| 10 | 1020 | 1000 | | | |
| 11 | 997 | 977 | | | |

| 198 E Potassium Sulphocyanate | | | | | |
|-------------------------------|------|------|------|-----|-----|
| 1 | 1077 | 1117 | 7248 | | 252 |
| 2 | 1066 | 1100 | 7238 | | 250 |
| 3 | 1047 | 1087 | 22 | 933 | 967 |
| 4 | 1027 | 1063 | 23 | 853 | 873 |
| 5 | 1010 | 1047 | 24 | 900 | 947 |
| 6 | 993 | 1020 | | | |
| 7 | 997 | 1030 | | | |
| 8 | 993 | 1033 | | | |
| 9 | 993 | 1037 | | | |
| 10 | 990 | 1027 | | | |
| 11 | 957 | 997 | | | |

199 E Potassium Sulphate

| | | | | |
|----|------|------|------|-----|
| 1 | 1117 | 887 | 7245 | 256 |
| 2 | 1110 | 1073 | 7228 | 251 |
| 3 | 1090 | 1047 | 22 | 957 |
| 4 | 1067 | 1000 | 23 | 867 |
| 5 | 1053 | 1010 | 24 | 797 |
| 6 | 1033 | 987 | | |
| 7 | 1043 | 997 | | |
| 8 | 1043 | 998 | | |
| 9 | 1050 | 998 | | |
| 10 | 1043 | 990 | | |
| 11 | 1013 | 953 | | |

200 E Potassium Chloride -

| | | | | |
|----|------|------|------|-----|
| 1 | 917 | 1087 | 7215 | 249 |
| 2 | 1107 | 1087 | 7189 | 253 |
| 3 | 1083 | 1043 | 22 | 977 |
| 4 | 1060 | 1057 | 23 | 890 |
| 5 | 1047 | 1037 | 24 | 807 |
| 6 | 1017 | 1000 | | |
| 7 | 1033 | 1013 | | |
| 8 | 1023 | 1000 | | |
| 9 | 1033 | 1010 | | |
| 10 | 1027 | 997 | | |
| 11 | 990 | 957 | | |

202 falls very slowly-

201 E Potassium Bromide

| | | | | | |
|----|------|------|------------|-------|-----|
| 1 | 1103 | 1123 | After heat | 7.298 | 263 |
| 2 | 1110 | 1110 | | 311 | 258 |
| 3 | 1080 | 1083 | 22 | 933 | 933 |
| 4 | 1053 | 1057 | 23 | 860 | 860 |
| 5 | 1043 | 1043 | 24 | 810 | 813 |
| 6 | 1020 | 1017 | | | |
| 7 | 1037 | 1038 | | | |
| 8 | 1036 | 1020 | | | |
| 9 | 1040 | 1030 | | | |
| 10 | 1027 | 1023 | | | |
| 11 | 993 | 997 | | | |

202 E Potassium Ferrocyanide

| | | | | | |
|----|------|------|------------|-------|-----|
| 1 | 1083 | 1053 | After heat | 7.275 | 260 |
| 2 | 1073 | 1050 | | 7.160 | 252 |
| 3 | 1060 | 1027 | 22 | 913 | 977 |
| 4 | 1027 | 1050 | 23 | 897 | 893 |
| 5 | 1036 | 950 | 24 | 867 | 833 |
| 6 | 1000 | 954 | | | |
| 7 | 1020 | 947 | | | |
| 8 | 1013 | 967 | | | |
| 9 | 1017 | 990 | | | |
| 10 | 1010 | 933 | | | |
| 11 | 943 | 913 | | | |

Rapid action - much gas, had to
pour off excess -

203

| | | |
|-----|-----|-----|
| 120 | 643 | 687 |
| 121 | 627 | 673 |

204

| | | |
|-----|-----|-----|
| 120 | 720 | 713 |
| 121 | 700 | 733 |

203 E Potassium Bisulphate

| | 1108 | 1127 | 7305 | 268 |
|----|------|------|------|-------|
| 1 | 1108 | 1127 | 7305 | 268 |
| 2 | 1093 | 1120 | 7282 | 263 |
| 3 | 1076 | 1087 | 22 | 917 |
| 4 | 1043 | 1073 | 24 | 827 |
| 5 | 1000 | 1037 | 25 | 850 |
| 6 | 1020 | 1050 | 46 | 401st |
| 7 | 1013 | 1047 | 66 | 823 |
| 8 | 1023 | 1050 | 67 | 717 |
| 9 | 1000 | 1040 | 68 | 733 |
| 10 | 987 | 1050 | 114 | 717 |
| 11 | 1050 | 1073 | | |
| 12 | 1050 | 1077 | | |

204 E Potassium Carbonate

| | 1130 | 1133 | 7775 | 261 |
|----|------|------|---------|-----|
| 1 | 1130 | 1133 | 7775 | 261 |
| 2 | 1113 | 1117 | 7812 | 258 |
| 3 | 1080 | 1077 | 23 | 927 |
| 4 | 1067 | 1067 | 24 | 887 |
| 5 | 1040 | 1040 | 25 | 880 |
| 6 | 1050 | 1050 | 40th of | |
| 7 | 1047 | 1047 | 66 | 877 |
| 8 | 1043 | 1040 | 67 | 800 |
| 9 | 1033 | 1040 | 68 | 800 |
| 10 | 1017 | 1000 | 120 | 753 |
| 11 | 1103 | 1077 | | |
| 12 | 1073 | 1073 | | |

205E Potassium Ferricyanide

| | | | | |
|---|------|------|---------------------|-------|
| 1 | 1067 | 1067 | 7 190 | 252 |
| 2 | 1050 | 1053 | 10 H ₂ O | 7 110 |
| 3 | 1000 | 1020 | | 243 |

| | | | | | |
|----|------|------|-----|---------------------|-----|
| 4 | 1000 | 1000 | 23 | 850 | 893 |
| 5 | 997 | 990 | 24 | 833 | 897 |
| 6 | 993 | 987 | 25 | 833 | 897 |
| 7 | 973 | 967 | | 40 H ₂ O | |
| 8 | 977 | 977 | 66 | 840 | 840 |
| 9 | 930 | 933 | 67 | 780 | 773 |
| 10 | 900 | 917 | 68 | 800 | 810 |
| 11 | 900 | 917 | 120 | 760 | 757 |
| 12 | 900 | 917 | 121 | 627 | 675 |

206E Potassium Formate

| | | | | |
|---|------|------|---------------------|-----|
| 1 | 1110 | 1133 | 7 153 | 251 |
| 2 | 1103 | 1117 | 7 243 | 252 |
| 3 | 1063 | 1053 | 10 H ₂ O | |

| | | | | | |
|----|------|------|-----|---------------------|-----|
| 4 | 1050 | 1060 | 23 | 937 | 943 |
| 5 | 1023 | 1033 | 24 | 887 | 893 |
| 6 | 1040 | 1040 | 25 | 873 | 877 |
| 7 | 1033 | 1033 | | 40 H ₂ O | |
| 8 | 1043 | 1040 | 66 | 860 | 860 |
| 9 | 1033 | 1030 | 67 | 757 | 800 |
| 10 | 1000 | 997 | 120 | 777 | 767 |
| 11 | 1080 | 1063 | 121 | 710 | 720 |
| 12 | 1090 | 1067 | | | |

Curious

203 to 208 -

Hot Capacity is only

100 less than Cold

Capacity -

Strange -

all about same

207 E Potassium Citrate

| | | | | |
|----|------|------|------------|-----|
| 1 | 1113 | 1123 | 7 198 | 261 |
| 2 | 1113 | 1093 | 1044 7 220 | 253 |
| 3 | 1080 | 1067 | 23 | 960 |
| 4 | 1073 | 1047 | 24 | 900 |
| 5 | 1043 | 1013 | 25 | 890 |
| 6 | 1053 | 1017 | 40 625 | |
| 7 | 1053 | 1003 | 66 | 913 |
| 8 | 1067 | 993 | 67 | 820 |
| 9 | 1057 | 990 | 68 | 810 |
| 10 | 1023 | 967 | 120 | 787 |
| 11 | 1107 | 1027 | 121 | 717 |
| 12 | 1100 | 1027 | | |

208 E Potassium Benzene Sulphonate 466.04

| | | | | |
|----|------|------|------------|-----|
| 1 | 1157 | 1150 | 7 213 | 260 |
| 2 | 1140 | 1133 | 1044 7 315 | 249 |
| 3 | 1133 | 1103 | 23 | 967 |
| 4 | 1090 | 1077 | 24 | 917 |
| 5 | 1063 | 1047 | 25 | 900 |
| 6 | 1077 | 1050 | 40 625 | |
| 7 | 1080 | 1043 | 66 | 917 |
| 8 | 1087 | 1047 | 67 | 813 |
| 9 | 1067 | 1030 | 68 | 810 |
| 10 | 1047 | 1000 | 120 | 787 |
| 11 | 1127 | 1000 | 121 | 707 |
| 12 | 1127 | 1067 | | |

209E

210E

211 E.

Sup of 1902

| | | | |
|-----|-----|-----|---------|
| 1st | 680 | 695 | reduced |
| 2 | 650 | 670 | |
| 3 | 675 | 700 | |
| 4 | 675 | 705 | |
| 5 | 690 | 690 | |
| 6 | 650 | 685 | |
| 7 | 740 | 775 | |
| 10 | 825 | 870 | |
| 11 | 845 | 870 | |
| 12 | 830 | 870 | |
| 13 | 780 | 805 | |
| 14 | 770 | 805 | |
| 16 | 875 | 870 | |
| 17 | 815 | 825 | |
| 18 | 810 | 825 | |

1902A

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1490 | 1425 | 14 | 1600 | 1550 |
| 2 | 1575 | 1490 | 16 | 1625 | 1620 |
| 3 | 1550 | 1485 | 17 | 1600 | 1565 |
| 4 | 1450 | 1430 | 18 | 1585 | 1535 |
| 5 | 1435 | 1400 | | | |
| 6 | 1500 | 1425 | | | |
| 7 | 1635 | 1580 | | | |
| 10 | 1700 | 1645 | | | |
| 11 | 1745 | 1660 | | | |
| 12 | 1675 | 1625 | | | |
| 13 | 1585 | 1550 | | | |

Silver Lake-

| | Old | 72 reduced in H sec |
|----|-----|---------------------|
| 1 | | |
| 2 | 795 | 805 |
| 3 | 780 | 790 |
| 4 | 795 | 785 |
| 5 | 780 | 825 |
| 6 | 785 | 810 |
| 7 | 755 | 770 |
| 8 | 775 | 750 |
| 9 | 850 | 855 |
| 12 | 890 | 900 |
| 13 | 900 | 910 |
| 14 | 875 | 890 |
| 15 | 840 | 850 |
| 16 | 830 | 845 |
| 18 | 900 | 910 |
| 19 | 875 | 865 |
| 20 | 890 | 890 |

1902A

| | | | | |
|----|------|------|----|------|
| 1 | | | | |
| 2 | 1720 | 1700 | 14 | 1625 |
| 3 | 1700 | 1650 | 15 | 1525 |
| 4 | 1670 | 1625 | 16 | 1520 |
| 5 | 1675 | 1635 | 18 | 1590 |
| 6 | 1600 | 1600 | 19 | 1540 |
| 7 | 1575 | 1575 | 20 | 1500 |
| 8 | 1590 | 1590 | | |
| 9 | 1665 | 1685 | | |
| 12 | 1670 | 1680 | | |
| 13 | 1690 | 1690 | | |

Much H_2O_3 hydrex

stained cons with 1% NAA but
clipped —
n

all concn Sales Regenerated Old Fe

212 E Potassium Chloride Salinated

| | | |
|----|------|------|
| 1 | 1180 | 1420 |
| 2 | 1300 | 1485 |
| 3 | 1230 | 1475 |
| 4 | 1270 | 1400 |
| 5 | 1155 | 1385 |
| 7 | 1125 | 1325 |
| 8 | 1230 | 1400 |
| 9 | 1140 | 1375 |
| 10 | | |

213 E Old Fe K Al Sulphate &

| | | |
|----|------|------|
| 1 | 1365 | 1600 |
| 3 | 1400 | 1520 |
| 4 | 1430 | 1675 |
| 5 | 1300 | 1525 |
| 7 | 1235 | 1380 |
| 8 | 1235 | 1345 |
| 9 | 1315 | 1460 |
| 10 | 1290 | 1400 |

214 E Old Fe K Chromate

| | | |
|----|------|------|
| 1 | 1365 | 1420 |
| 3 | 1275 | 1245 |
| 4 | 1335 | 1350 |
| 5 | 1250 | 1300 |
| 7 | 1160 | 1175 |
| 8 | 1125 | 1135 |
| 9 | 1225 | 1235 |
| 10 | 1145 | 1150 |

weighed 1% Kell.

1%, Kell, 10 and 100
has ferric O₂,

1% w ash Kell

215 E old K' Duphida (Foss)

| | | |
|---|------|------|
| 1 | 1190 | 1355 |
| 3 | 1420 | 1535 |
| 4 | 1440 | 1550 |
| 5 | 1425 | 1520 |
| 7 | 1420 | 1435 |
| 8 | 1375 | 1410 |
| 9 | 1460 | 1505 |

216 E old K' Mangenata,

| | | |
|---|------|-----|
| 1 | 1025 | 790 |
| 2 | 855 | 810 |
| 4 | 825 | 780 |
| 5 | 785 | 725 |
| 7 | 660 | 665 |
| 8 | 625 | 620 |

217 E old K' Mangenata

| | | |
|----|------|------|
| 1 | 1480 | 1525 |
| 3 | 1490 | 1545 |
| 4 | 1445 | 1645 |
| 5 | 1425 | 1525 |
| 7 | 1380 | 1400 |
| 8 | 1275 | 1375 |
| 9 | 1375 | 1455 |
| 10 | 1355 | 1415 |

Gas Ferric (66)

Little Ferric (66) - Brown

1% K₂CO₃ -

218E ~~ad f~~ K Permanganate.

| | | |
|---|-----|-----|
| 1 | 815 | 825 |
| 3 | 690 | 660 |
| 4 | 560 | 600 |
| 5 | 590 | 550 |
| 7 | 570 | 565 |
| 8 | 530 | 545 |

219E ~~ad f~~ K Bisulphate.

| | | |
|----|------|------|
| 1 | 1620 | 1535 |
| 3 | 1750 | 1675 |
| 4 | 1755 | 1690 |
| 5 | 1600 | 1560 |
| 7 | 1585 | 1525 |
| 8 | 1545 | 1550 |
| 9 | 1605 | 1555 |
| 10 | 1575 | 1550 |

220E ~~ad f~~ K Permanganate.

| | | |
|----|------|------|
| 1 | 1370 | 1335 |
| 3 | 620 | 620 |
| 4 | 750 | 795 |
| 5 | 740 | 752 |
| 7 | 1055 | 1080 |
| 8 | 1135 | 1150 |
| 9 | 1300 | 1345 |
| 10 | 1240 | 1290 |

Head Zone Ferric (H)

221 E old Fe - K Phosphate.

| | | |
|----|------|------|
| 1 | 1495 | 1500 |
| 3 | 1600 | 1600 |
| 4 | 1600 | 1600 |
| 5 | 1520 | 1500 |
| 7 | 1465 | 1425 |
| 8 | 1435 | 1400 |
| 9 | 1495 | 1475 |
| 10 | 1460 | 1440 |

222 E old Fe - K Iodide.

| | | |
|----|------|------|
| 1 | 1610 | 1590 |
| 3 | 1680 | 1635 |
| 4 | 1660 | 1600 |
| 5 | 1530 | 1500 |
| 7 | 1500 | 1435 |
| 8 | 1500 | 1430 |
| 9 | 1575 | 1515 |
| 10 | 1535 | 1475 |

223 E old Fe - K Oxalate.

| | | |
|---|------|------|
| 1 | 1415 | 1460 |
| 3 | 1545 | 1580 |
| 4 | 1545 | 1600 |
| 5 | 1410 | 1410 |
| 7 | 1375 | 1350 |
| 8 | 1375 | 1300 |
| 9 | 1455 | 1440 |

224 E old Fe - R Perochlorate

| | | |
|----|------|------|
| 1 | 1660 | 1600 |
| 3 | 1640 | 1600 |
| 4 | 1600 | 1545 |
| 5 | 1460 | 1445 |
| 7 | 1580 | 1415 |
| 8 | 1520 | 1420 |
| 9 | 1590 | 1465 |
| 10 | 1535 | 1470 |

some ferric ore

225 E of I_2 - K Bichromate

| | | |
|---|------|------|
| 1 | 1200 | 1250 |
| 3 | 680 | 685 |
| 4 | 680 | 684 |
| 5 | 600 | 674 |
| 7 | 625 | 625 |
| 8 | 600 | 600 |

226 E of I_2 K Nitrite

| | | |
|----|------|------|
| 1 | 1440 | 1465 |
| 3 | 1475 | 1500 |
| 4 | 1455 | 1500 |
| 5 | 1310 | 1395 |
| 7 | 1240 | 1340 |
| 8 | 1200 | 1330 |
| 9 | 1260 | 1380 |
| 10 | 1245 | 1345 |

227 E of I_2 - K Arsenite

| | | |
|----|------|------|
| 1 | 1470 | 1525 |
| 3 | 1560 | 1600 |
| 4 | 1600 | 1650 |
| 5 | 1800 | 1825 |
| 7 | 1520 | 1510 |
| 8 | 1500 | 1500 |
| 9 | 1575 | 1595 |
| 10 | 1550 | 1565 |

228 E of I_2 K Carbonate

| | | |
|----|------|------|
| 1 | 1575 | 1550 |
| 3 | 1730 | 1680 |
| 4 | 1735 | 1660 |
| 5 | 1600 | 1520 |
| 7 | 1525 | 1475 |
| 8 | 1520 | 1445 |
| 9 | 1545 | 1525 |
| 10 | 1550 | 1475 |

229 E The old Iron without
any treatment just as sent 1885
Kelt nearly out

| | | |
|----|------|------|
| 1 | 1595 | 1675 |
| 3 | 1665 | 1740 |
| 4 | 1665 | 1740 |
| 5 | 1580 | 1645 |
| 7 | 1560 | 1575 |
| 8 | 1555 | 1575 |
| 9 | 1600 | 1630 |
| 12 | 1585 | 1645 |

230 E Old iron without any treatment
Kelt nearly out

| | | |
|---|------|------|
| 1 | 1595 | 1550 |
| 3 | 1690 | 1700 |
| 4 | 1725 | 1740 |
| 5 | 1600 | 1650 |

from 212 to 230 sent to

7 1550 1590
9 1580 1645

Take to 68 grams
then 50 @ 60 mesh 10%
new 1/2 cup added
made into 7 gram packets
no kg added except 10% in the 10% new

Ur chl in at 11 am Tuesday just cost
only little excess of liquid
Out drying Friday 9 am -
put on hot plate $1\frac{1}{2}$ " block.
off hot plate 1130 pm -
Drying Monday after Chloride all out,
24.2 gms 4 fl - wt 7744 - 236 Dimp
7734 230 "

56 gms Uranium chl to
A4 chl

8 A4 to 1 lb Ur C 5.16 Dithion -

63 Cents per A4 -

Chemist says green contains
4.48% Uranium figured as
Uranium Chloride -
2.81% Metallic Uranium

See next page

231 E Uranous Chloride
10% reacts a little acid
from hydrofluoric -

Just put zinc in solution on
green to salivate it 7 gms. $\frac{1}{32}$
of solution above it

Put soak 11 am Tuesday 5/8" ~~231 E~~ 4 1/2" dia

Took out Friday 9 am for drying
at 3 pm in white pie plate put on
hot plate, $1\frac{1}{2}$ " high black
Took off 1130 pm - Saturday
at 1020 am put in 10% NaOH.

started washing ^{out NaOH} at 130 pm
Saturday

Tuesday air dried interval &
put in bottle.

Chemist testing percent Uranium
in -
Sent to Smith to put up 2 short
tubes -

Uranium etc

| | | |
|-----|------|------|
| Run | | |
| 1 | 903 | 927 |
| 2 | 1043 | 1050 |
| 4 | 1178 | 1160 |
| 5 | 1193 | 1183 |
| 6 | 1190 | 1167 |
| 7 | 1217 | 1197 |
| 8 | 1243 | 1233 |
| 9 | 1247 | 1230 |
| 10 | 1254 | 1243 |
| 22 | 1322 | 1257 |
| 23 | 1317 | 1270 |

about 100 gm

loading of back
page
after 500 g

| | | | |
|-----|------|------|-------------|
| 64 | 1377 | 1344 | |
| 65 | 1327 | 1267 | |
| 66 | 1293 | 1233 | |
| | | | Hot. |
| 119 | 1310 | 1260 | Hot top 577 |
| 120 | 1273 | 1200 | |
| 121 | 1300 | 1257 | |

1333-1287 to 1/2 V

This would require about 100 gm
Black Sp. Cobalt per A4 cell
at 1.20 lb 23 Cents for Cobalt,

240 E

40% Concentrated Cobalt
Chloride put on $Ni(OH)_2$

12.30 Vacuum dry in battery
jar - no excess 817 cc of solution

Runs see
No 2 book

The $Ni(OH)_2$ for
the 2 A4 cells - contain 5.82%
Metallic Cobalt or

9.17% of Cobalt hydrate dry

Each A4 cell is dry 8 tubes
there was not enough hydroxide

WEigh all when dry
no excess liquid

200 gms old $\frac{1}{2}$ in 3% Sulphurous acid, twice back of liquid to back of $\frac{1}{2}$

200 gms 175cc Sulphurous acid

Soaked 52 hours = washed
3 or 4 times 24 hours
dried - Very black when
started to dry - when
dry quite red

Should have been dried
in vacuum or H_2O vacuum
but with alcohol

232 E

$\frac{1}{4}$ lb Duplicate of 156 E
Old $\frac{1}{2}$ 3% Sulphurous acid

I will number it

232 = 3% Sulphurous acid
2 days, washed & dried with
ferric on surface. Should
have been washed in alcohol
to stop ox - ground thru
60 mesh 10% new Fe mix
added a 7 gram packet of

| | | |
|----|------|------|
| 1 | 1650 | 1640 |
| 2 | 1685 | 1745 |
| 3 | 1650 | 1670 |
| 5 | 1635 | 1600 |
| 6 | 1610 | 1590 |
| 7 | 1645 | 1600 |
| 8 | 1580 | 1585 |
| 9 | 1540 | 1580 |
| 20 | 1615 | 1660 |

233E Old Fe. soaked K Benzate
at 219 - Hard to count

| | | |
|----|------|------|
| 1 | 1800 | 1745 |
| 2 | 1800 | 1735 |
| 3 | 1770 | 1615 |
| 5 | 1600 | 1525 |
| 6 | 1525 | 1500 |
| 7 | 1600 | 1555 |
| 8 | 1500 | 1465 |
| 9 | 1465 | 1450 |
| 30 | 1425 | 1450 |

234 Old Fe K Chlorate
at 220 - Hard to count

| | | |
|----|------|------|
| 1 | 1845 | 1750 |
| 2 | 1850 | 1800 |
| 3 | 1700 | 1675 |
| 5 | 1550 | 1525 |
| 6 | 1675 | 1500 |
| 7 | 1735 | 1545 |
| 8 | 1640 | 1500 |
| 9 | 1540 | 1465 |
| 30 | 1700 | 1585 |

235 E Oldfa K Sulphite

221 Ott - Hard to wash

| | | |
|----|------|------|
| 1 | 1870 | 1950 |
| 2 | 1870 | 1945 |
| 3 | 1750 | 1790 |
| 5 | 1640 | 1650 |
| 6 | 1610 | 1610 |
| 7 | 1650 | 1670 |
| 8 | 1590 | 1635 |
| 9 | 1575 | 1595 |
| 30 | 1615 | 1590 |

236 E Oldfa - K Cyanide

222 Ott, Hard to wash.

| | | |
|----|------|------|
| 1 | 1845 | 1745 |
| 2 | 1750 | 1665 |
| 3 | 1735 | 1650 |
| 5 | 1720 | 1625 |
| 6 | 1690 | 1590 |
| 7 | 1740 | 1630 |
| 8 | 1640 | 1525 |
| 9 | 1585 | 1525 |
| 30 | 1615 | 1465 |

237. E old Fe (Hydrosulphite)

224 att, hard to compare

Dries very slowly -

| | | |
|----|------|------|
| 1 | 1180 | 1200 |
| 2 | 1660 | 1600 |
| 3 | 1635 | 1600 |
| 5 | 1650 | 1600 |
| 6 | 1650 | 1560 |
| 7 | 1650 | 1625 |
| 8 | 1595 | 1535 |
| 9 | 1595 | 1540 |
| 10 | 1810 | 1775 |

238 E old Fe K Bitartrate

att 225, 10. active (iron)

| | | |
|----|------|------|
| 1 | 1900 | 1900 |
| 2 | 1955 | 1950 |
| 3 | 1815 | 1815 |
| 5 | 1715 | 1720 |
| 6 | 1690 | 1680 |
| 7 | 1735 | 1700 |
| 8 | 1655 | 1675 |
| 9 | 1650 | 1660 |
| 10 | 1700 | 1705 |

239F Old $\frac{1}{2}$ soaked 2 or 3 days
 twice with Sulphurous Acid 6%
 (I think 6%) - soaked 2 days ~~with~~
 H_2O changed - then H_2O drained off
 soaked Denatured Alcohol
 2 days - dried - it ~~is~~ ~~now~~
 all through - dried - Alcohol sent
 precariously sent to Meador
 All now are granules then
 60 mesh 10% spread for mix
 added & make up into
 7 gram packets for Quinine
 trials

* Changed Nichols - no low cell -

| | | |
|----|------|------|
| 11 | 1630 | 990 |
| 12 | 1335 | 2075 |
| 13 | 1315 | 2140 |
| 14 | 1475 | 2245 |
| 15 | 1460 | 2140 |
| 16 | 1480 | 2070 |
| 17 | 1530 | 2085 |
| 18 | 1470 | 2090 |
| 19 | 1475 | 2110 |
| 20 | 1480 | 2225 |
| 21 | 1450 | 2225 |
| 22 | 1095 | 1770 |

240 To the Big lot of
Cobalt Ore for Nickel-

100 Records — 10 Good
Cost Total —
\$1000 for the
10 —

$$100 \overline{) 1000} (10$$

(ITEM(S) FOUND IN BOOK)

EDISON CHEMICAL WORKS

THOMAS A. EDISON, President
H. A. BACCHAN, Vice-President & Genl. Mgr.
H. F. MILLER, Treasurer
W. H. HERADOWICHOFF, Secretary

J. V. HIGGINS, Manager

Telephone (4128) Newark Branch
(4127)
Telegrams Address: Via Newark, N. J.
Electric Address: Waller Street, Newark, N. J.

SILVER LAKE, N. J. July 9th/14.

Mr. T. A. Edison,
Edison Laboratory,
Orange, N. J.

Dear Mr. Edison:-

Report on Loading Tests of Iron Mixes

Made from Ferric Ammonium Sulphate.

Your experiment numbers- 249 E

250 E

251 E

252 E

Tests made with Machine #704 - Factory Loading Dept.

" " by W. Archer, Storms, & writer, July 6, 1914.

Alterations to machine - Hopper supplied with two parti-

tions to take small hopper, so that the small samples could be loaded into two pockets at a time. Arranged in middle of machine.

Samples considerably too small to allow full number of pockets to be loaded at once, and also too small to make much adjustment to reduce loading weight.

In each case, two or four pockets were loaded before the test pockets were loaded.

Following are the results:-

(Cont.)

[ITEM(S) FOUND IN BOOK]

(Page 1a)

GENERAL SUMMARY

| Experiment | Dumps | Loading Weight. |
|------------------|-------|-----------------|
| 249 E | 14 | 8.66 gms. |
| " | 14 | 8.67 " |
| " | 16 | 8.65 " |
| " | 16 | 8.95 " |
| Feeding O.K. | | |
| 250 E | 15 | 8.69 " |
| " | 15 | 8.35 " |
| Feeding O.K. | | |
| 251 E | 15 | 8.57 " |
| " | 15 | 8.42 " |
| " | 15 | 8.56 " |
| " | 15 | 8.46 " |
| Feeding O.K. | | |
| 252 E | 19 | 8.95 " |
| " | 20 | 8.79 " |
| " | 20 | 8.98 " |
| " | 20 | 8.995 " |
| Feeding O.K. | | |
| Reg. Batch #1945 | 12 | 8.250 " |
| " | 13 | 8.150 |
| Feeding O.K. | | |

This is the same iron as the others but not pressed.

Details of these experiments are as follows:-

(Cont.)

[ITEM(S) FOUND IN BOOK]

(Page 2)

Iron was pressed in 10" die mold

Experiment 252 B- Moisture 5% 21 KOH

Pressed 2000 lbs.

Special iron #1945.

Thru 10 mesh; fines in.

Setting of cams, etc., same as for regular iron mix.

Loaded two pockets as preliminary:-

" four test pockets:-

| | | | |
|------|-----------|--------|------------|
| #1 - | 19 dumps, | Ld.Wt. | 8.95 grams |
| #2 - | 20 " | | 8.79 |
| #3 - | 20 " | | 8.98 |
| #4 - | 20 " | | 8.995 |

Feeding O.K.

Experiment 249 B- Moisture 2% of 5% KOH

Pressed 2000 lbs.

Special iron #1945.

Thru 10 mesh, fines in.

| | | | | |
|-----------|----------------|---------|-------|------------------|
| 2 pockets | - General test | - Dumps | 15-16 | |
| 2 " | " " " " | " " | 15-15 | |
| #5 " | For Special " | " " | 14 | Ld.Wt. 8.66 gms. |
| #6 " | " " " " | " " | 14 | 8.67 " |
| 2 " | - General test | " " | 15-15 | |
| 2 " | " " " " | " " | 16-16 | |
| #7 " | For Special " | " " | 16- | 8.86 " |
| #8 " | " " " " | " " | 16 | 8.93 " |
| 2 " | - General | " " | 16-17 | |
| 2 " | " " " " | " " | 16-19 | |

Last four pockets high in dumps as small amount of iron was
in hopper. Feeding O.K.

[ITEM(S) FOUND IN BOOK]

(Page 3)

Experiment 250 E- Moisture 2% H₂O.

Pressed 2000 lbs.

Special iron #1945.

Thru 10 mesh; fines in.

2 pockets - General Test - Dumps 15-16 Ld.Wt. 8.96 gms.

Increased stroke of cam to lessen Loading Weight.

2 pockets - General Test - Dumps 15-16 Ld.Wt. 8.97 gms.

Increased stroke of cam to the limit.

2 pockets - General Test - Dumps 15-16 Ld.Wt. 8.98 gms.

#11 " For Special " - " 15 8.63 "

#12 " " " " - " 15 8.33 "

Feeding O.K.

Experiment 251 E- Moisture 5% saturated LiOH

Pressed 2000 lbs.

Special iron #1945.

Thru 10 mesh; fines in.

Same setting of machine as last test in Expt. #250-E.

2 pockets - General Test - Dumps 14-15 Ld.Wt. 8.575 gms.

2 " " " " - " 13-15 6.495 "

#13 " For Special " - " 15 8.670 "

#14 " " " " - " 15 8.420 "

#15 " " " " - " 15 8.550 "

#16 " " " " - " 15 8.450 "

Feeding O.K.

In all cases the feeding seemed to be O.K. as far as could be judged with the small samples. No clogging whatever.

After completing the above tests, made a test with a small sample of Iron Mix ¹⁹⁴⁵~~1944~~. Same iron as in above tests, but

[ITEM(S) FOUND IN BOOK]

(Page 4)

not pressed, and just as sent from Silver Lake.

Setting of machine same as last previous test given above.

| | | | | | | | | |
|---|---------|---|--------------|---|-------------|--------|-------|------|
| 2 | pockets | - | General Test | - | Dumps 15-16 | Id.Wt. | 0.155 | gms. |
| 2 | " | - | " | " | " | 15-15 | 0.285 | " |
| 2 | " | - | " | " | " | 16-17 | 0.055 | " |

Added more iron to hopper.

| | | | | | | | | |
|-----|---------|---|--------------|---|---|-------|-------|---|
| 2 | pockets | - | General Test | - | " | 13-14 | 0.245 | " |
| #17 | " | - | Per Special | " | " | 12 | 0.250 | " |
| #18 | " | - | " | " | " | 12 | 3.150 | " |

Feeding O.K.

Possibly this pecks in hopper slightly more than the iron which was pressed, but the general feeding was satisfactory to Archer, and Storms, the foreman.

Yours very truly,



[ITEMS(S) FOUND IN BOOK]

MEMORANDUM EDISON STORAGE BATTERY CO.

July 9, 1914.

Mr. Bachman:-

Following report is of 3 bottles of Iron
Mix which Mr. Edison sent over July 8, 1914, for
loading weights and remarks.

Mach. #704 Center of hopper was divided so as to
load only two pockets. Machine feed fingers upon full.

| | | | |
|------------------------------|----|----------|---------|
| #1- Sample- A pocket dumps = | 10 | Weight - | 8.910 |
| | 10 | " | - 8.790 |
| Feeding O.K. | 10 | " | - 8.930 |
| | 10 | " | - 8.770 |

| | | | | | |
|---------------|---|---|----|---|---------|
| #2- Sample- A | " | " | 10 | " | - 9.090 |
| | " | " | 11 | " | - 9.140 |
| Feeding O.K. | " | " | 10 | " | - 9.100 |
| | " | " | 11 | " | - 9.230 |

| | | | | | |
|------------------|---|---|----|---|---------|
| #3- Sample- A | " | " | 9 | " | - 9.110 |
| This sample did | " | " | 10 | " | - 8.720 |
| not feed as good | " | " | 9 | " | - 8.510 |
| as the other two | " | " | 10 | " | - 8.570 |

samples.

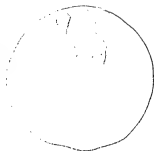
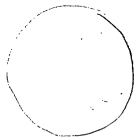
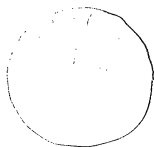
Notebook Series -- Notebooks by Edison
Notebook, N-14-04-30

This notebook was used by Edison during the period April-July 1914. It is the first of a four-book series continued by N-14-08-07. The entries pertain primarily to the transfer process involved in disc record manufacture and to the production of record blanks. The first part of the book contains notes on the problem of wrinkles on transfer plates and possible solutions to this problem. The entries describe experimental transfers made according to different production schedules, with various varnish compounds, or with differently prepared transfer plates. Several notes indicate that many test results were invalidated because a mute was mistakenly left in the phonograph used to test records for quiet surfaces. One entry toward the beginning of the book relates to the solution used in the electroplating processes involved in disc record manufacture. Entries in the middle and end of the book describe the production of experimental blanks and transfers and experiments to improve the varnish. The last entry establishes a new "standard varnish." Employees Jonas W. Aylsworth, Charles Dally, William W. Dinwiddie, Archie D. Hoffman, Charles W. Luhr, and Sherwood T. (Sam) Moore assisted Edison with this work. The front cover is labeled "No 1 Disc." The pages are unnumbered. Approximately 135 pages have been used.

April 30 1914
Disc Expts.

RD is due to Varnish -
It has taken 3 yrs to find
this out, only get it when
get blank perfect so on
homogeneous by Rubr pad

The var in drying wrinkles,
generally radially -
~~but some parts so that~~
~~wrinkles are not to plate~~
~~instead of on face~~
surface so far the
thick part of Discs give
most wrinkles
+ these wrinkles give some
radial wrinkles so
print, the wrinkles cannot
be seen in mirrors after
print but can only
the wrinkles are out



Steps
of wrinkles

(Apr 30 1964)

hear when playing record -

If a Record gives a Run out
to say call RO 100%
surface - it will be like



This is going to be a very
difficult problem to
solve. The record next to
plate is very much softer
than outside of the strain
is different, the outside is
drier as stuff goes off
then always leaving some
underneath,

Nearly Every Transfer
plate has these wrinkles
on in fact not one is
free of them

Apr 30 1944

By stoning with $\frac{1}{2}$ " white
Arkansas stone, the tops of
the worms are very conspicuous
by stoning down till they
disappear, the RO ~~phenomenally~~
disappears —

These wormholes cannot
be seen in Meers —

WE tested the vacuum in
Meers and plates —

The transfer gives the
RO — Evidently wormholes
show them very much
weaker than on plates

then ^{get so much} collect print they
show them very much
weaker —

To fix —

1 = Rig up machine & stone
pennies etc & stone them off

2 = Flow Varnish so they do
not occur

3 = Dry Varnish so they
do not occur

4 = Put low viscosity Varnish
all of them occur

14230
5 = Double flow plates

6 = Put something into
Change Vapor tension

7 Dry in Vacuum

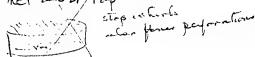
8 Bake to rubbery point 160
+ press smoothly on polished
steel plate or glass at 120°
Fahr + put in oil + Run
over irregular - Can be very
quick -

9 = Put Varnish on by sprayer
so Alcohol dries as Vapor goes on
do it by machine +
section for all Vapor -

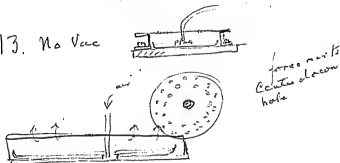
10, Dry little Ampal ~~to~~ Acetate Ampal
to stop drying surfaces too fast,

11= flow a very thin preliminary flow of
then Varnish 3 times or twice the
etching dry & then flow regular
Varnish -

12. let it dry with Cover on sides &
Mosquito net over Top



13. No Vac



14-



clock all over
4 12 o'clock
no wheels -

15- Change the schedule of Running
Over, stoping draft so it hits all way
leaving late vapor at about -
so can not to dry top. v. first,

16 Flow 25 cc Reg V dry 1 hour
then 25 cc water,

17- Add to Each ~~285~~ grams of
Vermist. 14 grams Neophthalin

18 Ditto 28 grams Neophthalin

19- Trichlorophenol ~~28~~ grams -

145

Note - Alcohol brushed over
a well waxed plate,

takes out wrinkles after

1 hour in air warm

and shows streaks of

brass which will not

give RD - This is easily

Correct

These plates were 24 hours per
dried plates ready for oven
too soft to stand brush -

20, very fine light pencil trace will
not sink there. Surround like
around say 200 mesh screen
picks in cloth bag decanted
good a few minutes after
flaming -

21 - flow plates when palm form
scrape at edge -



to open -

22 = ~~Flow~~ Rub a little
Assume rag around edge -

no reaction or Para

The Chlorine in Varnish that gave
least or no RD is

365 5% Parachloroaniline 70 RD

382 5% Acetanilide "

473 3% 5% 12% Parachloroaniline "

455 Alkali Blue BR none 5% "

May 1 1944

367 cc without Para but with Para
in —

367. cc Varnish with 14.4 gms
of dry Ferric Chloride in

367 cc Varnish without Para
but with Para. Add up to
7 gms of dry Ferric Chloride —

~~365~~

367-42 Van without Para or Para
put in - 8 grams of
Parachloroaniline —

— Yellow Even flow + no waves

Phenolphthalein alone in
Varnish looks all para
on. Para - gives off a strong
230. But a very light yellow
transparent Varnish in
apparently no more of a
Red in the mixture.
Whereas all the others
(several Expts) showed it at
night.

Transferred 2 plates OK
Printed the trans OK
Compared it with Reg
No left over.

May 2 1914

367 cc Reg Varnish with Para. Para in
14 grams of Camphor.

367 cc Reg as above
with 28 grams Camphor.

367 cc Reg Varnish with Para. Para
with 14 grams Ortho-Nitrophenol.

ditto 28 grams Nitrophenol (ortho)

367 cc Reg Varnish with Para. Para
14 grams Para Dichlorobenzol.

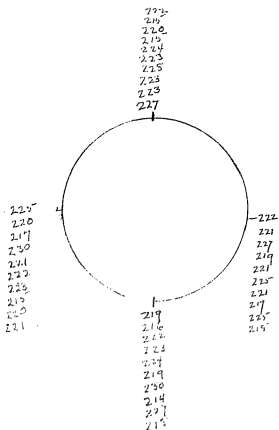
ditto 28 gram " "

367 Rag Var with Para & Penta
with 14 gms Nitrophenol (para)

ditto, 28 grams "

So far only ones that are free
of Waxes & have some of Coes
are Phenylsulphonate

+ the other is Parachloraniline
both with Para & Penta



May 1914

| | | | | |
|-----|-----|-----|-----|-----|
| 227 | 223 | 223 | 228 | 223 |
| 222 | 221 | 227 | 219 | 221 |
| 219 | 216 | 222 | 223 | 224 |
| 225 | 220 | 217 | 222 | 221 |

Moore weighed some this morning
390 - all of them - I weighed 394 -

May 1914

Possibly wax molder with a ball
has same size as the knife that
Cet used & held it down by a
spring & slowly pressed it
down. it would make it
very fine & then gratified in
respect way would give fine
results -

Also with 170 Conduite
press it up at 150° Fels
with 1/4 inch glass plate
& then cool it & draw out
print from matter -

Put dry in

419 Beautiful yellow

370 Parachloroaniline gives

Dark blue surface -

Translucent yellowish
plate - no waves -

These tried long ago May 1914

| | | % Sol | Transp | Good |
|-----|---------------------------|-------|--------|------|
| 361 | 5% Perchlorobenzol | 81 | 21 | 17 |
| 364 | Alpha Naphtol | 91 | 22 | 20 |
| 365 | 5% Paratoluenedisulphonic | 91.6 | 24 | 22 |
| 368 | 5% Metakresylendiamine | 83.3 | 24 | 20 |
| 370 | 5% Paratoluenedisulphonic | 83.3 | 24 | 20 |
| 385 | Sat Chloride ammonia | 100 | 13 | 13 |
| 381 | Phthalic Acid | 93.3 | 15 | 14 |
| 382 | Azotamide | 86.6 | 15 | 13 |
| 415 | Reg P Phenylendiamine | 100 | 12 | 12 |
| 419 | Acetic Magnesia | 91.6 | 12 | 11 |
| 436 | Salicylic Acid | 83.3 | 12 | 10 |
| 439 | 5% Saffranine base | 91.6 | 12 | 11 |
| 440 | Phosphine | 90 | 48 | 43 |
| 521 | Reg P + Para | 100 | 24 | 24 |
| 519 | Gum Dammar | 94.4 | 18 | 17 |

May 1914

Dope used in preliminary CuSO_4 bath - filled water solution of Eope) seems perfectly tolerable & not a Callard in decomposition -

$\frac{1}{2}$ pint filled Thom across one few blue spots, several of brown some red -

Put some dope in the Reg CuSO_4 sol & filled - no effect but more pieces caught on filter showing with red lines flooding particles in -

Tried some of the dope discolored in pure water. Shook with bone black nearly discolored it showing that it is a very finely divided Callard. Depending it was not an acid & combined well the time of the phos. here in bone black.

May 1914

We now try to get carbon out of
water desalinated dape no acid
lay bone black treatment 2 or 3
times — use it in cell to
see if its just as effective

Agitating Dape with Quick
lime no change hence
Phosphorus in Bone Black
don't affect it —

I put a solution water
white, Dried low tailed

the Sol before passing
Bone black & the water
white after passing
Bone black — The water
white is not as inert
whereas the blue is OK

May 1944

4 pieces that the effect was
 entirely due to the color
 particles & that the depth
 is not a true solution
 but an extremely finely
 dispersed ~~solid~~ ^{liquid}
 like ~~concrete~~ ^{concrete} ~~beef~~
 even finer — Erio-A

New Blanks new landing -
 Rubber $\frac{1}{2}$ " plunger in pan
 + 475 grams powder
 swirled off.

1st Lot. 336 - NOT BAKED.

Transfer - OK 288 discs 48 - now 320 -
 85% - discards all cracked & broken

2nd Lot. 1187 - BAKED -

Transfer 792 - disc 395 66%

all print OK - its varnish & its
 probably safer to ~~be~~ ^{be}

1st print of RO with sides
but not edges. I am not
near —
2 more prints, both RO 1 quite strong
free edge 2 make best OK - good impression —

May 1940

Daily just finished two Expts

15 plates flooded with Varnish
Without Para or Penta but
with 5% Phenolsulphonic
acid —

7 transfers made 6 OK
perfect. 1 had a bend in
label, but w OK & normal
only one yellow spot on
whole 14 plates & that close
to blank as it was on both
sides —

This fine Varnish - are printing
them to see effect, cracks
using tracked blank mould

1 plate blistered in oven
flows very much as seen by
edges of transfers

May 1914
also Dally flowered 14
plates -

Vermish 4% Penta,
no Paraphenyl but 6%
Parachlorophenyl -

OK 2

| | |
|---|------------------|
| 3 | Birds on a nest. |
| 1 | " " both sides - |
| 1 | " " 1 percent. |

This is rather,

Because Parachl
Condenses & rats the 6/4

May 13 1917

We put 2 grooves in brass plate
 $\frac{3}{16}$ thick

11

flamed with lacquer. covered 48 lb.



put 8 binding pieces on edge

put in press boat to 200 lbs.

gradually increased heat
till condensed. Came out
nearly perfect must season
a week to prevent cracking -
finally used 85 lbs. steam

Very promising

With no Para or Penta - RD unit is bad as Reg
Reg Vane Buffed - not buffed -
no bluffs - RD but unbuffed
has clearly yellow green surface

Prints -

OK 1 -

Bad Coasts 1



May 15 1914

Daily places 6 ahead in the
Cham lot -

No waves on the surface

Reg Vane with without para no
Penta -

OK 4 - all OK (red coasting)
+ good fill no flows -
Reaction 15 plates / not used (and
fast small bubbles - Directly
says that the high or quick
things could get with OK +

Reg Vane with Para Penta -

ends on lower 1/2 covered with para (the last 1/2 hour)

5 trace (few)

3 OK - 1 Cooked 1 burned

Edge - none were filled. Appears
that either Para or Penta are the
makes Cooked places + without
them no cooking - see above

X
Surfaces good -
2 surfaces have no RD
2 " " not very much
Much better than Reg

RD. worse than X

Dally X
5% 33% Sal Phosphate
+ 2% Paraphenylenediamine
Plates OK
Transfers all OK 7

Dally
10% Sal 33% of Phos
Dulphonite. Run same time
as X above plates full of
bubbles -

OK 1
Couch 1 6 -
Bonds 3

Water cracked at Edge 1
Schedule too rapid or
Rubber paint too high -

2 Prints

2 faces Very faint RO
2 " Light RO

1 pretty good Var
general surface smoother
than Reg Var

2- Prints RO all 4 faces but
not Back

There is scarcely a doubt
but the wrinkles in Vernish
cause the Run Out,

Dally
Varnish No Peeling or Peering
5% Indigoculphuric acid
7 Trayed all OK.

Dally
10% Indigoculphuric
6 printed All Discards

Birds — This shows
that too much peccants
hardening — or the 10% Indigo
all did not down run (off)
clots that made birds —
Rubber 6/14

9

Beta Naphthol

8%

Al 5%

5%

from old record (cont.)

Resorcinol 5% No RO - 2 1/2 + 3.5% same +
Benzonaphthol " 4 OK 1 v. slight RO
Benzotriazolinone 5% 4 RO 1 v. slight RO
Pararosaniline 5% 1 OK 1 OK
Metaphenylenediamine 5% 2 Tested no RO
Acetanilid 5% 5 OK No RO 5%
12% acetanilid too much -

Bromo p. A 5% 4 No RO 1 v. slight RO
Acid Dye #4 BNS 5% 4 OK 1 v. slight
Cute a little -

Aniline 5- 4 No RO 1 standard
Acid Green GCX 5% 5 OK No RO -
Methyl Blue BR 5% 5 OK No RO "

561 - 3 Para 5 Beta 12 = 11 OK No RO 1 v. slight

Schedule run in Dallas
Cylinder - to get rid of birds
& bubbles, by getting scheduled
out early or just go to rubbery
state & hold there long time

Handled at 120 fahr
One hour to reach 140 fahr
Held 2 hours at 140 "
Then took one hour to reach 225
Held it at 225 for one hour

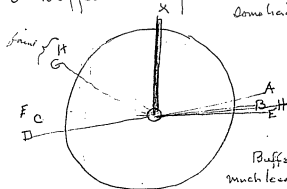
Took them right out in air at 225
No cracking -

Plates showed no birds, bubbles
or bubbles except 1 to 3 such
plate from dirt good looking
plates -

Transfers 5 = all OK except
one due to very bad blank
This schedule seems good
~~just the~~

8 Buffed Transfers: Irregular round

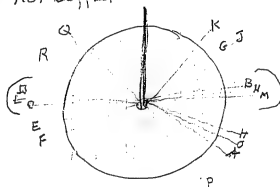
Some had no Runnet



Buffed more
much less RO &
surface than Not
Buffed

X represents grain of plate

Not Buffed



Evidently dirt also makes Runouts as
well as grain

Paraform Varnish in place 6/4
Run in Oven Reg-

They are soft. Can stick finger
nail in - Evidently want
higher & longer heat for Paraform
Surfaces even but all $1/2$ high
surface -

Will Transfer Buffer Print on
tracked mold -

All Paraform plates stuck
on transfer - Not heated
enough - To harden -

Paraform is a high temp
long heating hardener

Daily Selected 22 plates
that didn't show straight grain
of metal



had none of this -

Used reg Vermorel Reg. ^{Daily schedule} Cakes

Transferred & Printed

all OK - Very fine velvet
surfaces - of the 21 surfaces
(1 surface had reg plate)

14 had absolutely no Run Out
- that could be detected by
horn on a track. & track
One had VRO very soft.

3 " VV-

3 " VVVV " hardly hear

This seems to prove that there
is unequal shrinkage due to lines
on metal - One way shrinks easy
opposite no shrinkage -

We are now getting rid of the Mill Roll

Warks will finish so surface
is circular and polishing
Marks will be a multiple
of 150 Warks of the second

The surface in these records
~~is~~ is perfectly
satisfactory to treat

Rosolic Acid. Has the regular run outs
+ all ok but RD - shows run outs
not in Varnish as expect 1st
year gave no RD -
gives its striated plates -

Dally Run on his reg & schedule
which is OK for reg Varnish

Beta Naphthal 5% ^{of out of Resin} in Reg Var
without Petita or Pavia -

5 = Birds + Cooked - squinted out
at Edges - Wants different & higher
hardening schedule or more
6/4 -

Benzonaphthal 5% of out of Resin

2 OK 4 Cooked Bird -
Schedule must be higher & longer
heat, or more 6/4 squints out
at Edges but not so bad as
Beta Naphthal -

Rosolic Acid - 5% of the Resin
5 ^{transferred} ~~minutes~~ All OK - Dally

Schedule - Look good dark -
will print -

surfaces not very uniform not as good as
Metaphenylenediamine - but better than acetaldehyde

5% Pararosaniline (Curel)

Red Transmittance no bubbles

good - Very black

Transfer 1 bubble cracked 1 side Crack towards hole

| | | |
|----|----|--------|
| OK | no | VVV-VV |
| OK | no | VVV no |
| OK | no | VV no |
| OK | no | V no |

All had cracks
on edge -
neg

on side OK other Cracks + chd holes OK to hole

acetaldehyde - Transfers - Prints

OK III

Bubbles top 1 side 1

Bubbles one side 1

| | |
|------------|-------------|
| VVVV - VVV | full cracks |
| VVV - VVV | |
| no | V |
| no | cut |

Q. surface not very uniform

5% acetaldehyde -

Very light yellow - Curious little bubbles

1/2 to 1/4" round - many have a hole

in center, some none, this looks like

it resembles in spots in all commercial

grades of bubbles, Metaphenylenediamine don't

seem have any whereas Acetaldehyde

is phenomenal in this respect,

all prints same so must be a common

of Evacuated gas was formed after

Rubbing it high he hit or from on

Solid particles,

all had cracks on edge

Except 2 surfaces

These results show that very old
Experiments with various substances
were NG -

Must first use a definite schedule
see how they act then alter
time & heat for Vary the 6/4.

till third particular substance
gives good results -

Metaphenylenediamine 5%

plates look good - dark -

Transfer OK III = Print,

Prints

~~only~~ only 1 had cracks on
edge - actual -

VVVV - no

VVV - no

no no

no no

Very fine surfaces on all
sides - cuts a little
on smooth parts

This Varnish appears perfectly

adhering - + ok - che - p

Enough - no sand - like 100%

Transfer + Print, might want a little more

hardening to stop cutting in smooth

to cheaper than Para - 6.75 ml K. Meta 6 ml K

Daily schedule

Auramine, 5% all valuable

Plates

OK III III - practically no bubbles
or radial cracks -

Transfers

OK

Bad blank

OK

Lt the Cooked

NG

Cooked bad

OK

Cooked

OK

Cooked

Making
B...
blank today

Note ~~to Cooked~~ then note

Brown 4 A. no Cooked only

1 big blister. Some to make

2 prints

VR-VR

surface pretty good

no no

no cut

start bad, may be more -

No Cracks on Edge

Fully Schedule

Acid Violet 4 B.N.S. - all schedule

Plates OK Black IIII

(Wholes came off plate - plate highly
polished) -

Strips -

Some radial waves & some
bubbles. Very Black

Transfers

OK -
ng - bad C.-shd. Bad Blanks
OK today
OK
OK

2 printed vvv-vv - pretty fine
-no vv - start bad, maybe
surface in cut. Moulds in.

2 printed 1 Cracked on Edge

Daily Schedule
Bromo 4 A, Red

Plates OK III III Radial waves

Think radial waves rather prominent.
hardly any bubbles -

Transfer 2 prints No cracks on edge

OK Print 2

OK VV - no ro

Build checks

OK VV no Ro

Long -

OK Surface good

MG Big split blister.

All stand. Very fine - perhaps would be apt to

Its strange that 3 Para 5 people
all birds & rotten -
while this has no birds
& OK

Apparently a Oven
Schedule must be used
for Ench Varnish.
These 2 made in Dally's
oven schedule &
transferred came true.

Also in Reg Varnish if there
is a variation in proportions
it will give the schedule.

or if Resin has excess of
XPhthal, it will bind up on
oven schedule, if not enough
it will crack on painting.

Dally Schedule

5% Paratoluol sulfochloride -

Plates -
all OK. III III no bubbles
flows even - No radial cracks
transparent red light. Very few
bubbles - look good -

Transfers;

OK IIII

Cook 1/2 area of Ench. Bird blank

First time anything on the 1/2 area.
Dally says sample must be
thoroughly working off to do it.

> perhaps Varnish should be made
up & no 6/4 used. Then take sample
put in 6/4 & run 100 Transfers
if OK proceed if birds at
thors 6/4 - & try again -

Dallysalix lutea

3 Para 5 Petals —

All OK some radial waxes
but as Var is dark they are not so
Conspicuous than of *transparens*
only few Ecob. Glens —
Surfaces of all waxy

transparens —

Buds both sides ||||

" one side |

Very Bad —

These 2 tests surface vernals
has waves on the surface.

These are plates that look
grained but the roll marks
of grain of the metal & then
polished so marks would be
circular —

371 Daily
Plates made with spiral grooves in
plates made with Emery paper
Reg Vernals No 371 Daily —

OK IIII — Transfer OKII one part 30 minutes
Can hear any surface on this surface
Daily being very quiet — surface not smooth
much surface being so off
370 —

Plates made with spiral grooves
the IIII marks being ground out with
white oilstone — Reg Vern
Daily 370

OK IIII Transfer OKII
Left out not much

Can't hear any surface or No on any
of the surface — Daily on
very recent — think my hearing
is off today

Daily 368 -

Duchampierine CP

Very light yellow - full little round buds.

OK HH HH

Frage OK!

Sept 11/11 -

12th June 1900 (10 days after the 1st of June)

2nd one just below (20 mm or so below)

Maximum 1.1 mm - 1.2 mm

Daily 307-

5% Peraphosphoric acid -

OK10 - all ok - scarcely any better
fine variance - has some ~~and~~
~~several~~

Transfer - 16111

Being made by hand - 100 -

These are only 100g plates & accepted
fixed & polished with the usual
cleaning & lightening

All 14 surfaces - Count here - any
surface - 100g - 100g - 100g
great point,

2 1/2 Paraphenylenediamine

Reilly 372

plates - OK III III has excess
fine looking plates - no labels
etc -

Transfers - OK II

Birds II

Bad blanks -

2 Records Tracked -

Can't hear any RD 9 sounds.
hear only confusion with RD 10
Can't say if my hearing is off
or not - June 4, 1914

3 1/2 Parapharyngeal air mass
DCCy 3/8 -

OK III III = small waves - by swell
fine looking plates no bubbles

Transverse - OK II

Transverse end view I

Transverse end view II

Note 2 1/2 Parapharyngeal air mass
5/8 note also 1/4 note -

2 Records. Cannot hear any RD
+ can just hear surface

Made-on Balay

Daily 369 — Reeled repaired +
painted planks

3 1/2% Ammonium Chloride

Fls. OK - III III - very
recumbent but lacks no of
fls. in raceme like
like Petalocaulis.

Transfers - OK III
This is strange when 372 was made

2 Records - 1 shade NO.

1 considerable RR

surfaces can hear, and not so good as
2% or 3%, Ruminantia have a
which has general surface
so good that it is like a
to hear it —

all expts on surfaces
around this time vitiated by
the note being in without
our knowing it

Daily 375
 4 1/2% Methyl Violet 3 BP -
 Very dark

Big bubbles IIII

Small bubbles IIII

Notes: ...

Dilly 376 - 5/4 Jackson RT

Honorable Leg. ^{Pl. 11} 11

Big bubble 1111

few bubble 1111

Daily 374. Hole in hole B 4 1/2
 Lateral line

Coated one edge big with glue /
 Big subles many one side (H1111)

XXI — 60 Transfers Van 301a
 26 OK
 24 Dis. ends
 10 Coiled Cables
 9 left OK
 2 " not OK
 2 pull out
 1 Cracked Van

43%

June 2nd 1914

Edison XXI
 24 = Not Baked

Experiment on Joke bulbs for
 Joke for 5 bulbs —
 2 min contact with vacuum on 1000V
 Then increase pressure to 1000 lb to bulb
 for 7 min & shut off vacuum & cool
 keep up the 1000 lb —

Transfers with III

Bleached Cables III III II

Coiled cables OK I

Bleached Cables III

Bonding (Bleached) I

Bond I

43%

XX2 97 Transf -

OK 85 - 12 Discarded

Cooked Center 1

Left Chk 4

Thin hanging block 3

Pull out 1

87%

See next page for XX2

Edison XX2

24 - Not cooked

2 min Control at 100 lbs
steam 5 minutes at 1000 lbs
steam on then Cool off steam
Hot Cool holding at 1000 lbs

OK III III III

Blistering III III

58.3

1st up of XX3.

24- Not broken

OK III III III III I

NG Bird 1

Comel Bird 1

(broken) another 1

91.6%

XX2 61 Transf'd
39 OK
22 discarded

Cooled Carbs 1
Lift Cks 2
Lift Cks on side 16
Pile out 1
End Wares 2

63%

XX3 - 50 Transf'd
47 OK

Van 301 a

Lift Cks 2
Thin Manure 1

94%

Endcom XX3

24- not broken

5 minutes. Contract, at 100 lbs
clean, 3 minutes at 1000

165- Coal Keeping pile over on

OK III III III III

1st Comel III

NG Pull-out 1

Bird 1

91.6%

XX3 - Prints,

OK III III III III

Doublet III

82.6-

Notified, OK at 1000 lbs

XX3 - 50 Transf'd

45 OK

5 discarded

Lift Cks 4
Pile out 1

90%

Edison XX 4

Not baked -

3 Minutes Contact 100 lbs
 steam, 5 minutes with 100 lbs
 steam on at 800 lbs pressure.
 Cut off steam cool out
 keep the 800 lbs pressure on

102 are to make the 4 XX
 100 each 50 baked 50
 unbaked 4. Transfer them

OK ~~111~~ 111 111 111

Cooked water ng 11

Blower at 11 ng 11

ng Blower 1

78.25

Edison XX5

6 minutes contact at 100 lbs
steam pressure. Then 3 min
at 100 lbs with steam pressure
at 100 lbs. Then cool & keep
the load pressure on

17
Dep Dally 371 - needs with Emory paper
transfer OK HHI -

Mill ground plates
transfer OK HHI -

Dep reg Van reg process 370 Dally
Transfer - OK HHI
Blakes checked 1

Dalley 382 Green M $2\frac{1}{2}\%$

Plates

OK 1

lots of bubbles at edge one place runs so pouring to test
Bad peculiar diagonal

NG, I don't think one not baked enough
see general higher & other side from
black finger nail in -

Dalley 381 - Acid Green GCX $2\frac{1}{2}\%$

Plates OK ||||

Some bubbling, can't shake nail in -

baked OK - Waves considerable & CC

Dalley 388 - Acid Green BB $2\frac{1}{2}\%$

Bag Blister ||||
OK ||||

55% -

Shrink -
Don't shake nail in -

Jan 6 1914
 Dally Selected 10 Varnish
 plates - The Varnish
 having been patched -
 transferred them -
All were OK -

831- 6-1-14

Hoffman make enough recorder
 for 1000 blanks each
 1st (at to be specified as now -
 2nd lot. to be ^{#830} mixed old way, good
 a Bag each lot after 1st lot
 from the time of shipping
 \$30 make Blanks + work 77

Blanks at 2 the bank

Transferred 108

OK 54

Ducks 54

Coated Cans 28

Left, Cks 16

" " 1 edge 7

Ckd Vars 2

" wires 1

0

Over 7-

50%

832

310 Transferred, old schedule

Of 200
Vermin 110

| | |
|----------------------|----|
| Crooked Cakes | 9 |
| Left Crooked | 45 |
| Left Crooked on edge | 29 |
| Left not Chd | 5 |
| Thin margin edge | 14 |
| Pull out | 5 |
| Crooked wires | 3 |

64%

Run them a lot of powder
as you now make it. Enough
for 2000 blanks. Bag two
lots. The 3rd lot run them a
make

#832 Hoffman
1000 blanks right awayRun the 2nd lot in 48 hours
#833 Hoffmana the 3rd lot of car 72 hours
#834 Hoffman~~Another~~

835 Haffner

Make another lot of
blanks grained account

70 Then 180 March Recp

24 hours + make blank

old blank schedule 309 Van

Transfer 108

CR

62

even 6

Dis cards 46

Cashed Check

29

Left CR

27

Left CR & 24

10

CR Van

2

3 1/2%

#837 Haffman

3 1/2 to 1 Passes & Center
Passes mixed with some
mounds even on ground

Old schedule with work

Transfer 108

OK 63

Open 7

Diamond 45

Lat 309 Van

Cooked Center 16

Left Chd 17

Left Chd edge 7

Thin Marginal spots

Pull out

Chd Waves

Chd Van

Mechanical effect 1

5 7/8

Here is something new and
late end of May. Very handsome
special police. (The)
at some places I had
stone in the rubber marks
or otherwise. I saw them
with regularity.

Not good - The phone had a
Write on it & I didn't notice
it, it got moved & produced
these fine results when
removed the backed
seconds had ordinary
surface & irregular
RO

Remarkable -

Last week Dally had
some plates polished &
tied up. These had egg
varnish put on the
surfaces were very good
but some run out - the
regular plates & have had
fast surfaces & all had
strong Run out
about the 30th Dally
had John make some
plates with the straight
mill roll marks stone
out & polished circularly
The 1st used these
plates had a remarkably
smooth surface Edson
could scarcely hear & no
run out. This Edson
attributed to his hearing
gone bad Dally & Carmo
The 2nd surface was
faint, WE duplicated

W.G.

White was on

them with big bar again
& still no run out & general
surface. Elevation could be easily
heard.

But Dacey also
pointed from a very bad
streaked places,

& surprising to say
the general surface of
this was faint not quite
so faint as the slough
places & although there
was run out, they were
also very faint. 3 or 4
times fainter than the
same place in last week.

Now - the only change
we have made is that
on the 28th believe we
changed schedule of
overs & made harder
transfers & on the 2nd
of June we changed

Doubtful on
account of the
Mute

Schedule on the
blanks XX3 -

Apparently the
change in even
schedule was improved
surface & Run out,
although the plates
will still shake
which should have
been found & have
RO are put on blanks
which both Overt
blanks have schedule

NG
Mute was on

Changes, Better surface
than these are impossible
They are perfect, even
will ad plates they
are Comely perfect,
What caused it,

Oven or new schedule
giving problems
The Riser Condensed
as in XX's
or both = Run it
down

June 4th old blank schedule
 64% - 310 Trench oven 2
 71% 227 " oven mixed
 89% 146 oven 1/0 4
 25% 12 " 4
 53% 108 " 1

Low due mostly lifts & lifted edge
 Total 54.6

Old Reg Schedule

| | |
|----------------|---------------|
| 108 | 50% |
| 108 | 57 1/2% |
| 108 | 57 1/2% |
| 1166 | 32 1/2% |
| 224 | 70 |
| 615 | 76 |
| 560 | 60 |

XX3 Schedule working good

| | |
|----------------|---------------|
| 1142 | 78% |
| 1244 | 85 1/2% |
| 2314 | 81 |
| 229 | 70 |
| 152 | 63 |
| 252 | 81 |
| 114 | 76 |

| | |
|------|----|
| 3412 | 77 |
| 194 | 84 |
| 252 | 85 |
| 199 | 87 |
| 1092 | 80 |
| 172 | 83 |
| 385 | 84 |
| 3544 | 89 |

} mixed from oven 5

Average 80.5
 15286 Transferred
 12510 good
 without counter
 concave in 6

| | | | |
|-------|-----|-----|----------|
| Baked | 194 | 84% | } oven 1 |
| Baked | 199 | 87% | |

Dalley 381 -
Acid Green GCX $2\frac{1}{2}\%$
Transfer.
OK IIII before some emit.
old very schedule blank

Dalley 380

Acid Green B13 $2\frac{1}{2}\%$
old Reg schedule ^{blank} 37 samples -
Transfer.
OK IIII - one out transfer plate
was spoiled -

Dally 382

GREEN M $2\frac{1}{2}\%$

old Reg safe Lule blank
transfer OK 441 -

June 9 1914

Without Mute which has thrown
off - The runouts are just as bad
on stoned plates where rolling mill
straight streaks are ground out
by back air alone - as on plate
with marks in -

842 'is the

Number of the new

Rubber packed

Blank.

XX3 press schedule

5 min Contact at 150 lbs steam

3 min 100 lbs at 100 lbs "

Shut off steam & Cool

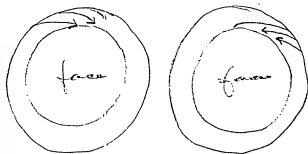
Paraphenylenediamine in solution
of H_2O in precipitated white
by 40% formaldehyde

Itas Meta Toluidin-propyl
reduksi —

Think possibly can use
paraphrased in
place of mine in
the ~~text~~ Hymn by Thomson
of this all ip form than if.
Announce you to form
Blessings I have ever —

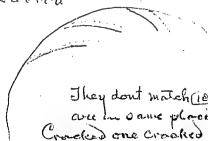
2 Cracked both sides
1 " one side

Phenomenon



Opposite each other + also

direction of cracks are
opposite looking from same
direction



They don't match (10 lines but
are in same place. The thing that
cracked one cracked the other

XX3 schedule

Took 12 new blanking transmitters &
printed them — got 100%
in the transmitters & percent 75%
Then covered them & tested

24 swiftons 16 no runout
4 VV faint
4 VV faint —

The swiftons are at least twice
as good as on regular old
schedule blank

June 10 1914

Graft

The RO is entirely due to blank
Veneer must work —

As to Tunes 48 tunes mostly 1 or 2
disco but

Welding Wounds mostly had 7

Vessi d'Art 11

Dreaming 10

4 others had 4 each -

2 " 5 "

12 " 3 "

10 " 2 "

16 " 1 "

Inspection of Cracked
Discoards — 128 Discs inspected

Cracked one side + no good 26

Crack both sides but passed 5

Crack both " not passed 5

Cracked one side but passed 10

Edge Music crack passed 8

Edge " " not passed 30

Not cracked or poor print - passed 3

" " not passed 9

Poor Prints NG 25-

" " + cracked 7

128

Edge music cracks 38

Other Cracks 53

Poor Prints 25

No Cracks other defects 12

I took 74 cracked records from sorting board just as they came from printing process. There was 43 times —

By seeing how many of each tuner obtaining Model numbers it is evident that records have much to do with Cracks, for instance Kathleen Maunson had highest number 5 - but only 2 model numbers were alike. Guess can be as high as 1000 of research although its queer that with 160 models on board, there should be so many of same tunes.



big crack ball
runs out or in
according to
direction of
Cracks —

5th Lat.

New blanks, Rub plid XX3 Solu disk

100 Blanks made -

100 Transfers made

3 discards - one left cracked 1 pulled out 1 cracked blank

97% good

Printing

97 printed -

one cracked - 2 poor prints, 16 knuckles

as come 77% but knuckles not done
the process ^{can be repeated}

97% -

^{blank}
100 taken 94 got to final test

842 is new blank -

8th Lot

Made 100 - Transfers

84 OK

8 Lits Cracked

6 Cracked Varnish

2 Mechanical Effects

83 Printed:

71 OK

11 Rejected for mechanical effects

1 Cracked

842 Blank

9th Set

100 Transfer made

92 OK

1 cooked case

2 left, cracked

2 pullouts

1 Cracked case

1 " " " " " "

Prints made 92 -

17 Rejected

75 good -

1 Cracked

2 poor print.

12 Cracked & Broken -

842

Lot 9

100 Transfers made -

93 OK -

3 left -

4 Cracked Transfers

Printed 93

OK 72 -

2 Cracked

4 poor prints

3 white spots

12 Cracked & Cracks -

842 Blanks

Lot 6 -

100 Transfers made

97 OK

3 discarded

1 Cracked Card

2 Left, Cracked

Prints made 97

5 Rejected

92 OK.

5 Cracked

* 3/4: 15 in 12, #1 44-
 Prints Cracked P.P.
 72 2 0

Dolly received 1/2 Blank
 out of this Lot,

This shows as far as 842
 Blank is concerned on 5 different
 Lots of 100 each
 We got an average of all the
 5 Lots of

Transfers 92.6% OK

Prints made 96.3

Only white spots, cracks & poor
 prints counted against blanks
 Cracks & knocks counted for
 blank -

Rejecting Everything Transfer
 & print - 76.4%

Went to shipping Dept,

4 loaders 4 blanks min
22 hours 1320 minutes
5280 blanks
per unit -
4 units

21120 blanks
per day

Scheduled Times

June 15 1914

Operation in new loading station

After loading - Pass to wire - press
pull coil from press back to shipping
station - 26 minutes
2nd 20
3 27 "

Pressing - Shipping in press -
pressing in coil of out of coil
from wire to back of press to
Shore 15 seconds

1 man on 2 loaders loads
1 per minute -

Shaver 1 man on press under
motor in 1 minute 20 seconds
with the 2 men on shore
for 2 with 1 man on 1 press
40 seconds

1st put on in 1/2 min

\odot $\times \times$ $\times \times$ \odot



$\odot \times \times$ $\times \times \odot$

Recorder near 4 hours
in Vase Engrain Hot water
used for holding
stacked 7 cokes

| | |
|------|-----|
| 730. | 80 |
| 745 | 90 |
| 8 | 100 |
| 815 | 105 |
| 830 | 108 |
| 9 | 110 |
| 915 | 112 |
| 945 | 120 |
| 10 | 125 |
| 1015 | 128 |
| 1030 | 130 |
| 1045 | 135 |
| 11 | 140 |
| 1115 | 143 |
| 1135 | 145 |

Water Heat

probably
no

⌒

test for heat blanker process in
Vase at higher temp —

| | |
|-------------------|-------------------|
| Var 343 | |
| Blank 846 | |
| Oven 344 | |
| Baked hours 9 3/4 | |
| Transferred | 727 blanks |
| OK | 496 |
| Discarded | 231 — 68 1/2 good |

| | |
|-------------------|-----|
| Cooked Center | 100 |
| Lifts | 117 |
| black thin margin | 4 |
| Pull out | 1 |
| Crisped wave | 3 |
| " Varnish | 8 |

Evidently this is NG, present only
wants higher heat using
steam —

2900 842 new Rublon blank
transfers in lots of 100 over
several days with many
different varnishes -

There was need from transfer
recm - 82.75% of all -
showing % good transfers
to be that amount. @ of 2900 blank

after printing all - there
was 75.72% of the whole
2900 - tested & passed -
but cracked or rough on face
are Counted OK - Cracked & Poor pts. down

In other words 2195
out of 2900 OVER OR
for Stick (when Cracked) record was
represented -

Stop Lifts & Cooked Centers
and - transfers were 62.96% or
better -

Out of 2900 842 blank
transfers there was

Cooked Centers 107 3.6%

Lifts 385 13.2%

Varnish Cracked 82 2.8%

Total 19.6%

Discards -

Cooked cents are due to
1st Varnish too thin in center
2 also blanks too thin in center

81st lot

9 3/4 hours oven 300 to 350

350 Van 842 blank-pressed 600 lbs
5 min Control 3 min 600 lbs cast

Transfer for 100% good

Print -

6 Kinks

2 Cracks

1 Rough surface

3 Cracked -

9 for reprint

Reprint -

97% including

85% Discarding reprint

85% to shipping

600 lbs pressure gives perfect
general surface than 1000 lbs
4 cannot probably be used

350 Van 9 3/4 hours oven 350
842 blank -

5 min Control 3 min 800 lbs
Cool -

Transfer 89% OK

1 Cracked Center

10 Birds

Prints, 86 printed 3 used on tracked record

10 Poor prints

1 Cracked

17 for reprint -

67.4% of those printed OK

If reprints included 83.6%
of those printed

or 75 out of 100 to stock
if reprints OK.

Picked, Even Van plates 842 blank
351 Van 9 3/4 even

Transfers 75% OK

8 Cracked Center

3 LfG

14 Cracked Vanish

Prints - 75% good -

9 poor prints

2 Cracked 64 good

Even plates Leap 842 blank
351 Van 9 3/4 even

Transfers 83% good

8 Cracked Center

3 LfG

1 Pull out

5 Cracked Van

Prints - 83% printed 60 good

16 poor prints

5 Cracked -

These results tend to show 842
blanks are low in the center
or full of gas.

Uneven plates (Varnish)
842 blank

351 Van 9 3/4 even

Transfers 68%

3 Cracked Center

14 LfG

1 Pull out

13 Cracked Van -

Prints - 58% good

4 Cracked

3 poor prints

Uneven Varnish plates,
351 Van 842 blank 9 3/4 even

99 - Transfers 66% good

11 Cracked Center

6 LfG

16 Cracked Varnish -

Prints 39% good

18 poor prints

100 in lat

Continuation of the 2900 542 100 each.

T 351 Van 400cm. 77 OK 11 cords 9 lifts 1 ckd Van
P 77 prints 64 OK 8 ckd 5 poor P

T 351 V 7 oven 9 3/4 79 OK 9 cords 9 ckd Van 3 lifts
P 79 OK - 1 ckd 5 poor prints

T 350 Van 1 oven 9 3/4 - 82 1/2 good 5 cords 6 lifts 2 pull out 4 ckd Van
Print 73 OK 9 poor prints -

Trans 351 Van 6 oven 9 3/4 75 good 12 ckd Van 11 cords C 2 lifts
P 68 OK 2 ckd 5 poor pls.

T 352A Van 23 oven 100-93 good - 7 cords 8 lifts 1 pull 1 cord
P 79 good 4 ckd 2 poor pls

T. 352A - Oven 2 - 84 good - 7 cords 2 lifts 1 pull 1 cord 1 ckd Van.
P 83 good 4 poor prints -

Jan 23 1944

I tested these trucked records
blanks made with 1000 lbs
800 lbs + 600 lbs for surface

1000 has good surface
800 has fair "
600 is rather rough -

There is a decided difference
between 1000 + 600 in
the surface - It looks as
if we must use 1000 lbs -
~~There is~~

24th June 1914

Powder dried with alum

354 Van 852 blank. made of clay

XX3 1000 Lbs -

Uneven Varnish Plates.

7 oven 9 1/4 -

145 Transferred 78% OK

14 Cooked Cakes

7 Left

9 Cracked Varnish

Duplicate. Same Varnish etc.

315 Transferred 83% good

31 Cooked Cakes

9 Left

12 Cracked Varnish -

Powder Steam heated in Vac -

355 Van 842 blank - Red pkg Nos over 9 1/2

100 Transfr 96 good

1 Cooked Center

1 Lft

1 Pk

1 CKD Van

Req blank 443 - Red pkg ~~2~~ Contain of Steam

355 Van over 1000 9 3/4 -

3653 Transfr - 74 1/2 good

304 Cooked Center

491 Lft

110 Cooked Van

Powder Steam heat 2004

842-842 -

354 Van over 7 9 3/4

108 Transfr 69 good

5 Cooked Center

7 Lft

20 Cooked Van

Req - 719 blank old 900 blank
7 hours mixed over 354 Van

1060 Transfr 67 1/2

159 Cooked Center

141 Lft

49 Cooked Van

354 Van 848 blank old pkg

600 Lbs steam over 1000

1393 Transfr 78 1/2 over

186 Cooked Center

56 Lft

54 Cooked Van

71g ad blank oom 93/4 mixed
354 Var

1010 Transf'd 52% OK

27g Cracked Cactus

12g Left

6g Cracked Vow

~~8534 854 1010g Var but 855 was
Kept 15 hours~~

✓
Results of Feeding

~~85~~ 83 presented —
75 OK

Cracked at Edge feed line 3
(cracked) in Muesia 1

Red Centers 3

Bubble hole in feed line 1

~~Reg Var but Kept~~
Reg Var but Kept —
Hoffman. Vis 3 min 15 sec at 70°
at 12:45 pm 24th June 10 sent up
sticks at 130 km Vis was
4 min 28 sec Thus Vis was immediately
taken when it got up sticks —
stood up & came from net
on ice 15 Vowens —
Vis at End of 15 hours at 70°
deg 10 was 23 min 35 seconds
Resolute —
Open 8-7 hours — 842 blank

100 Luce up'd — 47% OK
356 at 60 24th
1 Blank up
1 Cracked Vow —

^{Var 22g}
Dip above but no Para — raised
Pencil to 60° Hoff — Vis 3.05 at 70°
at 3:30 PM 24 June — 2nd rep obs at 14 min
at 70° — 3.11 sec — 15 hours after wash
Vis at 70° was 3.12 sec —
100 Transf'd. 88% good all uneven
357 at 10 5 Cracked Centers plates —
12 Little

| | | |
|---------------|----------|--------|
| | Transfer | |
| Even Unplates | | Uneven |
| Coated 8 | | 14.8 |
| Lifts 3 | | 9 |
| Chd V 9.5 | | 12.5 |

| | | |
|----------------|----------|------|
| | Prints - | |
| Poor Prints 12 | | 10.5 |
| Cracked 3.75 | | 2 |

This shows uneven
 Varnish is bad -
 Need some more solvent
 stop at 1.11.11.11 -

MGZ Expts - 854 Var - Uneven plates -
 842 washline CCEu 8 7 hours
 100 Trans - 830k 5
 Coated CCEu 5
 Lifts 12
 Prints 83 printed
 6 Kurch 50k to open 2 Roughen 1 cut
 1 Coated 4 print prints

Uneven plates - 854 Var CCEu 8 7 hours
 100 Trans 840k - 400k Coated 6 lifts
 2 Prints 4 Coated Var
 Prints - 780k 1 Coated 1 Coated 4 print prints

Reg Plates 853 - What is it + 15 hours
 842 blank Oven 8 7 hours 23 min Viscosity
 100 Trans 470k 51 lifts 1 Print out
 1 Coated Var
 Prints 36 0k 3 Coated 4 print prints
 4 have printed in blank - Means its
 the brush you use on showing 1.11.11.11

Evidently High viscosity is
 Very bad - Para which continues
 over Var & increases viscosity much
 be abandoned tight down results

Steam Dried powder 2007 oven 9/3/4

852 sf-blank and printing
145 transferred 114 OK
14 Cooked Center 7 left 9 Cracked Van
Prints 33 OK 15 Knocks 6 Cracked

Steam Dried powder 2007 oven 9/4

842⁵¹² new printing

100 transferred 96 good 1 Cooked Center
1 left 1 Burn 1 Cracked Van
Prints 3 Knocks 2 Cracked
4 poor prints - 87 OK.

1/4 Para - Reg powder - Steam dried
in the blank powder

118 Transferred 106 OK 89%

4 Cooked Center
6 left 842 blank
2 Cracked Van

Oven 3 9/4 hours

632 Reg Van Lat 359 B

6/29/14

842-blank Steam dried Vac
powder - 854 Vac no para 6% Para

Transf. 100 - 91 OK
2 Cooked
4 left
3 Cracked Van

Prints. 54 OK -

1 Cracked
7 poor prints - } 5 Discard

Knocks in Mold 17 -
Knocks 57

Hard powder in blank 1
Mould Tester 5

27 To be repeat -

Reg plates
T = 842 blank steam driven 89-57 OK 1 left 2 mechanical
P = 57-54 OK - 2 Knobs 1 poor print

1/2 Plate
T = 852-555-100 Turned 97 OK 3 cracked wares 7 hour oven
Print 95-79 OK - 6 Knobs 1 Cracked 5 rough wares 3 Cracked

842
T = 855-100 Turned 97 OK 2 cracked 1 pulled out
P = 97-84 OK - 7 Knobs 2 hair in 4 Cracked 7 hour oven

842-555
T = 100-98 OK - 1 Cracked Out 1 left 7 hour oven
P = 98-92 OK 3 Knobs 1 Cracked

ENR 1
T = 842-852-100 Turned 98 OK - 2 pulled out
P = 98-OK 80 - 6 Knobs 4 white spot 1 hole 3 bad Glue
2 Cracked 2 mould heat, 9 3/4 oven

ENR 1
T = 842-852 9 3/4 oven - 100-88 OK 2 cracked each
1 left 4 pulled out 5 Cracked Var - 852-367 Var
P = 88-81 OK - 6 Knobs 1 white spot

ENR 1 Reg plates
T = 842-857 = 9 1/4 oven 100-90 OK 1 left 8 turn plate
P = 90-71 OK 2 Knobs 1 cracked 3 Cracked 4 poor pi

ENR 1
T = 842-857-9 3/4-100-91 OK 3 Cracked 1 left
2 pulled out 1 Cracked wares 2 Chd Var 852 369
P = 91-77 OK 6 white spots - 3 bad Glue 4 Chd
1 poor pi -

5 Expt 6 -
T = 842-852 7 hour Expt 6 - 100-96 OK
Left 2 Cracked 2 -
P = 96-81 OK 5 Knobs 5 mould 4 moulds for
Reg plates

T = 842-857 9 3/4-100-95 OK 2 Cracked
1 pulled out 2 Cracked wares
P = 95-88 OK 1 white spot 3 hair in 3 Cracked

ENR 1 unreg plates -
T = 842-852 9 1/4-101-88 OK - 1 Cracked
3 left 5 pulled out 1 Chd wares 2 OK Var
1 mechanical
P = 88-78 OK 1 hole 1 white spot 6 moulds
2 to mould in use -

all new 842 black

OK 50% repair

all F1

hand ball

Alexander R. J.
McParment

Steam Dr.
Rising water
Vane

Steam Dr.
185' mine outcrop
200' Repair
Vane

| 855 | OK | OK | OK for | |
|------------|----------|--------|--------|----------|
| 1/2 ft. on | Transf | Print | Repair | |
| blasted | 97 | 79 | 12 | 85 |
| | 97 | 84 | 9 | 89 |
| | 98 | 92 | 3 | 94 |
| | 97.3 | 85 | | 89.3 |
| 852 | | | | |
| Sp. 7 | 98 | 80 | 6 | 83 |
| | 88 | 81 | 6 | 81 |
| | 96 | 81 | 14 | 88 |
| Under R.R. | 88 | 78 | 8 | 82 |
| | 92.5 | 80 | | 84.2 |
| 857 | 90 | 71 | 3 | 73 |
| | 91 | 77 | 0 | 77 |
| | 95 | 88 | 3 | 89 |
| | 92 | 79 | | 79.6 |
| | Printing | | | |
| 855 | Cracked | Cook C | Foot P | White sp |
| | 3 | | | |
| | 4 | | | |
| | 1 | | | |
| 852 | 2 | 3 | | 4 |
| | | | | 1 |
| 857 | 3 | | 4 | 6 |
| | 4 | 3 | | 1 |
| | 3 | | | |

Transferring

| 857 | Ordinary | Cracked | Pullout | Cracked | Sp. 7 |
|-----|----------|---------|---------|---------|-------|
| | 3 | — | — | — | — |
| | — | 1 | 1 | 1 | 1 |
| | — | — | 1 | 2 | — |
| | 3 | 1 | 2 | 3 | 1 |
| 852 | — | — | 2 | — | — |
| | — | 2 | 4 | — | 1 |
| | — | — | — | 2 | 2 |
| | 1 | 2 | 5 | 1 | 3 |
| | 1 | 4 | 11 | 3 | 6 |
| 857 | — | — | 8 | — | 1 |
| | 1 | 2 | 2 | 3 | 1 |
| | 2 | — | 1 | 2 | — |
| | 3 | 2 | 11 | 5 | 2 |

300

400

300

100 lot End

| | T | PT | RP |
|------------------|-------------------|-------------------|----|
| 20 248 542 blank | 93 | 80 | — |
| 9 249 | 93 | 78 | 15 |
| " 250 | 94 | 66 | 23 |
| " 251 | 94 | 88 | 3 |
| " 252 | 96 | 62 | 24 |
| " 253 | 93 | 83 | 7 |
| " 254 | 95 | 90 | 5 |
| " 255 | 96 | 76 | 17 |
| 7 256 | 96 ⁸⁹⁴ | 89 ⁷¹² | 15 |
| 9 257 | 87 | 70 | 14 |
| " 258 | 88 | 70 | 4 |
| " 259 | 89 | 68 | 4 |
| " 260 | 93 | 71 | 11 |
| " 261 | 93 | 74 | 6 |
| " 262 | 91 | 84 | 3 |
| " 263 | 93 | 84 | 3 |
| " 264 | 98 | 77 | 1 |
| " 265 | 96 | 87 | 4 |
| " 266 | 97 ⁹¹⁰ | 87 ⁷¹² | 4 |
| " 267 | 100 | 98 | 12 |
| " 268 | 100 | 79 | 6 |
| " 269 | 94 | 81 | 1 |
| 7 270 | 88 | 168 | 2 |
| 9 271 | 88 | 74 | 4 |
| " 272 | 94 | 82 | 3 |
| 7 273 | 87 | 71 | 3 |
| 9 274 | 91 | 87 | 3 |
| 7 275 | 91 | 87 | 3 |
| 7 276 | 91 | 87 | 3 |
| 7 277 | 91 | 87 | 3 |
| 7 278 | 91 | 87 | 3 |
| 7 279 | 91 | 87 | 3 |
| 7 280 | 91 | 87 | 3 |

Transfers 91.93% good

Prints 76.2.

If 53% of Reprints is obtained,

then Prints 80% good

to Shipping Dept,

Lifts 80
 Pullouts 18
 Cracked Wax 19
 Cracked Varnish 70
 Mechanical 13
 Birds 15
 Cracked Cellulose 26

67 Lots of 100 Each ^{papers all dated 7/9/14}
averaged 94.2 good Transfers

& without any allowed for Reprint
gives 75.8 good prints
passed as OK for shipping
by Testers —

There was 391 reprintable discard
assuming 50% good or 196 —
this gives 78.8 good
Prints,

Evidently 75% is
good safe average

Just tried Experiment on
Ortho Cresol for black
Vasculature with 6%
6/4 - New loading

Transfer

OK 9

Cond 2

Bad 1

12

Prints

all printed OK

Then shows we can
use Ortho Cresol
with 4 to 80% 6/4
in place of Phenol

Also used mixture of ref

2/3 phenol resin 5% 6/4

1/3 Common Resin -

Transfers with Pz 632 Var
having power in -

108 -

92 OK -

Dug best with 854 Var
which is Reg Var with
Pain left out + Penta mono-
more 4 to 6% 2/3 phenol resin
1/3 common

100 Transfers

75 OK

Dug of the 854 Var best 1/2 Resin
1/2 phenol resin

100 Transfers

57 OK -

Para seems to get much harder

July 2 1914 —

Experiments with MetaparaCresol
from Borel Day Chem Co

872 Varnish

1200 MP Cresol from SR

34 gm. Phenol

94.3 " 6/4 —

6% Parla (boiled out of steam)

+ 873 Varnish —

old Reg except used MP Cresol
+ Paraphenylenediamine

Flowed + baked = all cracked
bad, fix a pay too much
6/4 Condensed too much
wants less 6/4 —
leave place + very brittle
stiff —

Tried MP Cresol again, 6 7 8
9 + 10% 6/4 — with + without
Parla, ~~phenol~~ —

225 lbs in oven dont
Condense & escape — When
transferred, 15 min hot
at 100 lb. in steam pressure
they were hard nearly as hard
as I reg —

I think MP Cresol can
be made to work as
Veneer — it works OK in
powder —

Other Cresol with 6 Parla
2 para + Reg amount 6/4
dont harden in oven +
even when transferred
it melts + runs all away
there may be a mistake in 6/4
but that man seems to
put it in —

We find that Ortho Cresol (German)
don't broaden with 6/4 in
transferring, melts & runs off -

Mtlee Para Cresol from Bayway
Chem Co, Condenses to a Resin

But it acts Curious -

35% Formaldehyde in alcohol
makes a resin - & that is soft
& then is dehydrated &
it works good in powder
blanks - But Not 45 & 50
% Formaldehyde don't give any
special yield 75% but
goes off - Hence only 35%
or perhaps 30% Formaldehyde
can be used -

40 of MP gives 30 of Resin
using 35% Formaldehyde

Costing 10 cents lb for
resin even if the excess
coming over in dehydrated
is not any good

Varnish for plates -

With 4% Penta & $\frac{1}{10}$ % Para
the best GEs are too much

With 6% Penta & 1% Para
There is very few best GEs -

~~with 5%~~

With 5% Penta & 1% Para

It makes a fine glassy Varnish
but yet don't thicken but
little in 20 hours - so ok
using 7.9% 6/4 -

I now make New Standard
Varnish -

6% Resin
8 $\frac{1}{10}$ % Para - 8/10th%
8 $\frac{1}{10}$ % 6/4 -

Benzosulfonic acid. Neutralized by
Selenate gives deep yellow -
Benz Na & free SO_2 -
then Concentrated
by Evapn. Centrifuge and dry O -
Catalyze - 60% yield. Liquid
Na₂SO₄

BSulonic acid -
Neutralizing - pleural or
beginning Sulf Ni - 502
w/ 200

Zero-

12.

42016

Bromocresol green acid -

Sulphate Na -

Bengama Subhanta Na +
502

No. 143

$$\begin{array}{r} 23 \\ -18 \\ \hline 5 \end{array}$$
$$\begin{array}{r} 23 \\ 4 \overline{) 91} \end{array}$$
$$\begin{array}{r} 35 \\ 41 \\ 76 \end{array} \left(\begin{array}{r} 410 \\ 3500 \end{array} \right) \left(\begin{array}{r} 54 \\ 2 \\ 108 \end{array} \right)$$
$$\frac{1}{2} =$$
$$\begin{array}{r} 65 < 13 \\ 50 < 10 \\ 30 < 6 \\ 25 = 5 \end{array}$$

$$\begin{array}{r} 44 \\ 8 \overline{) 352} \\ \underline{32} \\ 32 \\ \underline{32} \\ 0 \end{array}$$

1450-

$\begin{array}{r} 21^3 \\ \underline{16} \\ 278 \\ \underline{20} \\ 347 \\ \underline{30} \end{array}$

$$\begin{array}{r} 145 \\ \times 72 \\ \hline 290 \\ 10150 \\ \hline 10440 \end{array}$$

**Notebook Series -- Notebooks by Edison
Notebook, N-14-06-09**

This notebook is a continuation of N-13-08-25.2. It was used by Edison and Peter C. Christensen during the period June 1914-February 1915 for a sequence of numbered "tracking tests" to improve the quality of the "white master" records. Preceding the tests are entries by Christiansen alone [not selected] listing various experimental preparations of wax compounds and phenol resins. The notes indicate that an employee named Miller (probably Joseph Miller) worked with Edison. The spine is labeled "Testing #2." The pages are unnumbered. Approximately 50 pages have been used.

402... Drags a little
Temperature 92 Fels

Feltier than the other 402 has a
very small drag due probably to
high temp 92°
Surface not so good as 651 -
Contains chips - shade Elec
651 none -

About like 402 chilled
little worse drag -

Tracking Test #101

645 - Very good almost perfect, surface & chunk is better than 651

651 - Don't think it is good surface as 655 -

657 - Drags little -

Drags Bad -

best surface

657 - About perfect, if not more than

651 - 84° Fahr. Contains chips -

650 - Shade of Drag -

Tracking Test #102

651 Not homogeneous - ingredients don't mix -

662 - just little progress surface than 651 but its good - no drag -

663 - About perfect no else contains chip, fine surface - only trace of heading ball -

664 Drags -

665 - Ok perfect, ordinary depth
Tracking chip is brown paint +
perfectly continuous. Even way
below knife chips are $\frac{1}{2}$ " long

Tracking Test

103

666. good but not quite as good
surface as 665, but continues
clump perfect like 665 -

667 - about same as 663,
slide more loose of Ball -

668 - Just same as 665 - good

669 - Same as 665 good

670 not quite as good as 665

Tracking Test

104

671. not good surface as 665

672 Very Electrical

673 not so good ~~clump~~ as
665 -

674 surface not good -

675 Very Very Electrical

676 Same as 675 -

Tracking Test

105

1. Some Electrical -
Surf - fogged -

2. Dragged - Fogged
Electrical -

3. Dragged & fogged
Electrical

4. Dragged & fogged
Elec -

5. Bad surface - chip not
continuous, think it should be

6. Elec surface not very good

Note -

Tracking Test

106

683 all short chips - fogged.
Curious - scarcely any chatter
marks goes to knife & some elec

684 Bad fog - No chatter Mk's -
chip 1/16 long, & some elec

685 Very Bad fog -

686 Bad fog

687 fogged - drag

688 Very Bad fog

689 fogged

690 fogged

Tracking Test

107

Very good - ^{much longer of bag} Continuum
chip, not blue - This acts
is nearly as good as good as
651 - ~~7000~~ Considerable -

7000 Considerable

- Perfect, absolutely Non Etc

694 Drags - too high temp
for this Glom -

- Drag: a little, temp too high
95 -

Not quite as fine surface as
693 - deep tracking chips not
very long - not this long
chip is slightly attracted to
back end -

Tracking Test

108

697 Matted - some drag
temp 76 -

698 Poor grain - not blue -

699 - Better surface than 698 -
matted grain - not blue - pretty
good cut, probably can be made
better -

700 Much better than 699 -
Continuum transparent chip when
deep cut, probably wants more
Carbon -

705 - Good = VERY

Tracking Test

109

706 Surface not homogeneous -
Chips bunch + clump
not Elec

707 Chips bunch + clump
Surface not good,

708 Not good surface

709 Perfect - Very fine ground
Chatter marks clean cut like
req way - Not Elec Chips
bunch + twine around -
Where ball goes makes surface
shreds bad but good surface
Very fine

Tracking Test

110

710 Better than 709 - ball has
no effect, Chip bunches -

711 About same as 710 -

Temp 76° Fakes
712 Surface not very fine, goes to
Knife no amount of delay
Chips spin + short - Not
Very good slight Elec

713 a little better than 712.
light chip continuous, heavy spirals
blunt + short Elec -

714 about same as 713 -

Tracking Test

111

715 Smelled + Dragged NG -

716 Dragged bad - Don't mix

718 Drags some - Don't mix

719 - not quite Consistent
a slight drag surface not
very good -

720 Some drag surface not fine

721 Drags - short & small chips

722 Drags "

723 Drags "

724 Very poor surface

Tracking Test

112

725 Very poor surface. Elected

726 better surface. Drags some
slightly. Elected -

727 Not good surface
slightly Elected -

728 Rough surface - deep
chip continuous - Drags
slightly -

729 fair surf - Drags little -

730 Surface not good - nearly
consistent straight Not Consistent
Chip. shade Elec -

Tracking Test

113

731 Nearly continuous chip
not spirally surface not
fine enough -

732 Bad surface -
all needle-like showing
Wax composed of two or
more things - must be
separated to get any
results -

Temp 80 Fals

733. Drags some - not good
surface spiral chips & possible
some electrical

Tracking Test

114

734 Coarse surface NG -

735 shade of dry surface
not fine enough - slightly else
spiral chips - broken knife
edge when broken using knife edge

736 Drags little. Surface not
fine - spiral chips -

737 Very poor surface NG

738 Not elec straight chip -
Rough poor surface -

739 good straight chip
no spiral surface not
fine -

Tracking Test

115

740 Very Coarse surface N9

741 " " "

742 " " "

743 Surface not good Coarse

744 " " "

745 Drags bad surface

746 Horrible surface

747 " " Drags

748 " " "

749 Better but too Coarse surface

Tracking Test

116

750 Bad mixture Rough -

751 Extremely bad mixture N9

752 Very Rough much better than 751

753 Rough like 752.

754 Fair but not quite fine enough grain limits a little & not very sharp - Chatter irregular

755 Slightly better than 754

756 Drags -

757 Don't Drag grain not quite fine enough - like 754 -

Tracking Test || 117

758 VERY GOOD no amt or drag - full spec - get this out + will be fine - 2 miller

759 Same as 558 but much harder chip short not continuous or as long as 758 - Has same spec -

760 - Like 759 - chips short when deep - if short chips don't hit the ~~ok~~ but think it will be found too hard + chips stick too much to second,

Tracking Test || 118

761 Drags - Curious - powder chips - go to knife - clearly defined chatter -
Beller make 2 cylind
for Miller -

763 Not so good as 761

764 Good - clearly defined chatter - chips break up - stick to cylinders 2 miller

Tracking Test

119

770 - Ok. Continuum chip
on light cut short chips on
heavy cut - not elec fine
grain - 2 Miller

771 Very fine -
Continuum chip light or
deep tracking - Chatter like
Reg - not elec - 2 Miller

772 About same as 771

773 Light Cut Continuum -
deep tracking powdery. Slick
Cylinders - Probably Too hard
Otherwise Ok fine surface,
no sunt or drag Chatter like Reg
Therm 68

Tracking Test 120

774 better than 773 Continuum
Chips to knife edge -
surface fine grain -
Pretty good - 2 Miller

775 Too hard,

776 goes to knife Continuum
chip - GOOD fine grain
no sunt or drag Therm 68
2 Miller

777 little too hard, chips
break at knife -

Tracking Test 121

778 chip continues to knife -
 pretty good grain fine.
 Very good - 2 for Miller

779

780 - goes to Knife Continues
 Very fine grain - Then 68
 think it could be OK at 75 -
 or 80 Slide too hard now
 chatter like Ray **GOOD** 2 for Miller

781 Best for continuous chip
 yet 68 takes continuous
 beyond knife - fine grain surface
VERY GOOD 2 for Miller

Tracking Test 122

782 all frosted N9 -

783 frosted N9 -

784 little raft, a slight
 bluish - no drag or run
 deep black continues
 chip -

785 - N9 - bloom on it.

786 ~~the~~ Pretty good - neck
 2 cylinders for Miller -
 surface not extra fine

Tracking Test 123

787 like 786 -

788 Good. Surface not very fine - 2 for Miller

789 Very good -
2 for Miller -

790 Good, too hard, Very fine surface & chatters
wall deformed & like

Regular 2 for Miller -

791 Too hard Can scarcely
go to knife - Chips break
up -

Tracking Test 124

792 Not so hard as 791 -
Continues chip to knife

2 for Miller -

793 - good - 2 for Miller - good grain

794 good 2 for Miller - good grain

795 - Surface not very good
= Contin chip like to splinter
break the Elec

796 Electrical But
Very good. 2 miller

797 fair but is little Elec

Tracking Test

125

799 Surface nq - Yellow -

798 Electrical

800 Electric not very fine grain
clump -

801 Some Elec - clumps -

802 Some Elec not very fine grain

803

"

"

804

"

"

805

"

"

Tracking Test

126

821 - Ok but bad mixture & surface
not Elec - Knife OK

822 Bad Mix - all comes off
in powder goes to knife -

825 Bad mix & surface - powdery
cut -

826 Bad mix & surface - powdery cut

829 Drags - Bad mix & surface

Tracking Test | 127

871 Works like Reg but appears harder.
surface not soft.

864 softer surface not quite
as good as reg white wax

863 surface ug -

860 Worst on Record so far

858 NB -

882 - Can't hear anything with
listening tubes except when
just beyond knife edge 40/1000
knife - its very elec chips clasp.
& went around, no powdery chip

Tracking Test | 128

900 Very good different from all
others. Chatter marks very fine
finest yet, goes to knife edge so
sharp. Can't see it. Some elec chip clay.

901 To hard chips beyond knife 2 are
very elec hard & low # of short chips.
Very fine chatter not near as
good as 900 surface blushed,

Tracking Test || 129

693 - wax # (Made Feb 16-1915)

Temp of wax 296° F
Water 93°

Started with Girault cold except center
piece was not ring Cold (wax runs)
after 16 min back bottom joint
and then put steam in ring
than back top joint -

by shaving it sound very rough
wax was very unclean

Tracking Test || 130

709 - was made same as #693
made Feb 22-15 (3-)
I was shaved 25 of Feb.
sent to Mr Miller for shaving 26-
he says it's hard to do.

Notebook Series -- Notebooks by Edison
Notebook, N-14-06-13.2

This notebook was used by Edison and an unidentified employee during June 1914. It contains notes on the process of forming disc record blanks. Entries by the unidentified employee at the beginning of the book provide a daily record of observations from June 3 to June 26 concerning "new process Blank machines" for the production of disc record blanks. The daily record includes information about problems with machines, the number of blanks produced, and the number of men working on various parts of the production process. The following entries, which are by Edison, pertain to experiments made with one of the loading and pressing machines to determine how to apply even pressure on the powder (used to form blanks) with a rubber plunger. Included are notes on the timing, the pressure applied, and changes in various equipment, such as scrapers and planers. There are also notes on problems with the powder and the varnishes used to coat the blanks. At the end of the book are several pages of drawings and rough calculations that relate mainly to the layout of a manufacturing department for the production of disc record blanks. The front cover is labeled "Disc Record." The pages are unnumbered. Approximately 50 pages have been used.

60912

Stone Co.,

MFG. STATIONERS,
95 JOHN ST.
AND
19 PLATT ST.
NEW YORK

New Process
842
Blank

6/3 -14

Starting of new process Blank machines

hammer stroke 94 to the min.
700 lbs pressure on hydrocoll press
7 1/2 in diam

Note taken of steel roller used in
first two operations clinging
to die with rubber pad in press

6/5-14

5 rounds turned out on the
old schedule #10
10 min on 1000 lbs hydrocoll
10 lbs steam and cool

3 rounds turned out on the
Edison Double XX #3

5 min on contact steam on full
3 " " 1000 lbs hydrocoll
steam on full then cool
under this schedule dial hand
held on 1000 lbs continuously
through both steam and cooling

6/8-14

padding schedule changed from
12 min to 1 min to avoid
dark spots.
note taken of change of the
above schedule for the better
we getting a more uniform color

6/9 - 14

Things in general running OK
today.

Total number of blanks turned
out today Two men 106 Day men
" " 126 Night "

June 10 - 14

Everything running OK

Total number of blanks turned
out today Two men 120 Day men
132 Night "

6/11 - 14

note taken of actual time consumed
from when the mold is taken filled
padded raised scraped wiped
ready for large press

| | | |
|--------------------------------------|---|--------------|
| Time consumed in filling and padding | - | 1 min 14 |
| " " " raising in press | - | 34 min |
| " " " scraping on table | - | 1 min 20 sec |
| Some 1/2 revolution of table | - | - |
| Time consumed in wiping | - | 1/2 min |

Lot #5 #6 #7 sent up today

Lot #8 run on the Gibson double X 3
recul with the hydrolic open
after having the 5 min contact
note taken of indicator on
hydrolic rising to 1150 lb act then
then dropping back to 1000

Total number of blanks
turned out today 192
two men on new flexing machines
one press man

6/11-14

night work

being a few oil spots on Hanks
only thing O.K.
Total number of Hanks turned
out by night men 192
two men on two press machines
one press man

6/12-14

day work

Two of packing machines
not running this A.M. on
account of powder becoming
lodged in cog wheels &
miller switch table.
Total number of Hanks turned out
by 2 men loading & extracting
and 1 pressman 214
change in powder on the last
100 turned out 44 being of
powder marked X X 3. This
powder to continue until
note taken of change
powder changed to regular
powder

6/12-14

night work

Things running along smoothly
note taken of small pellets
of brass in 3 of the blanks.
Both above mentioned fault
traced to a small brass
headed hammer that the men
were using to tap down
pins in blocks before filling
the same with powder
the above mentioned hammer disengaged
at once
Total number of Hanks turned out
by two men 136

6/13-14

Things running along very nicely today

note taken of 8 or 8 blades having small grains of grass in them traced to brass loading rollers

Total number of blades turned out today 276

2 men on new process machines one man extracting one press man

6/15 - 14
Change from 2 angle valves to one free way valve considerable trouble this morning with belt controlling blades on turn table.

All so hydraulic pressure helped us get it some to day.

Towards noon things adjusted them selves again

Total number of blades turned out today 288

2 men on machines one man running press one extractor and one press man on account of change of valves in packing press time in full operation about 1/2 hr.

6/15 - 14
Trouble with belt controlling blades on turn table during night

Total number of blades turned out by night crew 240

2 men on packing machines one man refilling one man extracting one press man quite some trouble with hydraulic pressure tonight

6/16-14

Things running very nicely today
Psycholick pressure went down
once today but did not
seem to have effected our blanks
in press
Total number of blanks turned
out today by 3 men on
new press machines one
extractor and one press man
Total 396

6/16-14

Machines running nicely

Total number of blanks turned
out by 3 men on new press
machines one extractor one
press man 396

6/16-14

Day run

Night "

396 Blanks

396 "

6/18-14

Change made in driving wheels
controlling main belt that
controlled blades on turn table
Psycholick went down one this AM
but did little harm to our
work in large presses
note taken of change of wheels
on main shaft to reduce speed
of blades on turn table
note taken of blades running
very irregular in scraping
off powder on molds on
turn table

Two more men added to crew
now at work on machines
at 4 PM. crew as it now stands
2 loaders one paper one man
on small press one extractor
one powder man and one
press man

Total turned out

480 Blanks

6/18-14

Having previous mention faults
every thing running O.K.
men increased by two men
Total output 450 Blanks

6/19-14 Day work No 2

Note table of change made in
running of large presses

starting from Lot #52 the
screw to run 5 min. bout
3 min. 1000 lbs the hydrolock
to be left open and 1/2 lb
on our previous Lot's we had
our hydrolock at 1000 lbs. out

Other wise thing 2 running
nicely
Total number of blanks
turned out 684

6/19-14

Night work No 1

Note table of hammers on two
of packing machines again
Total number of blanks turned
out tonight by 3 packers & 2
one pressman 724

6/20-14

Day work No 2 over

Hammers on above mentioned machines
fixed things running smoothly
Total number of blanks turned
out today 746

6/20-14

Night work No 1 over

Everything running smoothly

Total number of blanks turned out

60 rounds 702

6/22-14

note taken of rubber pad
becoming loose in small
press removed the same 6:30 PM
and replaced a new one
in place

been increased to 4 loaders

3 men caping 2 running
small press one extractor
one powder man 2 men on
large presses one man
distributing ^{and} and unloading
large presses

Total turned out today

1036 Blanks

6/22-14

Night shift

Every thing running OK.

Total out 1st & 2nd by No 2
crew

840

6/23-14

all but one of packing machines
stuck this AM.
fault. powder becoming lodged
in cog wheels under the packing
table

Total number turned out today

1152 Blanks

6/23

Every thing working O.K tonight
Total number of blanks
Total out tonight 552

6/24 - 14

All packing machines aligned
This A.M.
Left powder becoming lodged
in egg shells under
neath packing table

Note taken of change made
in scale controlling powder
shute
small lead wheel made
to be used in filling scoops
with powder for new process
machines

This change will be notice starting at
Lot #17. - 842 Blanks 845 17 powder

Note taken of firm extractor added
to new process machine outfit

Total output of blanks
today 1128

6/24 - 14

Night crew

Everything running O.K.
Total output of blanks

1080

6/26 - 14

Things running very smoothly today

Total out put today 1348 Blanks

6/26-14
note table of hydrostatic pressure
going down only 4 different occasions
this time all total 15 min. last
hydrostatic pressure very poor
this afternoon called
in doctor on road of hydrostatic
drifting as low as 400 ft.

1st 6 minutes of back thread out
Today 1152

6/27-14

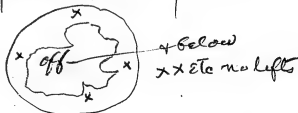
Things working O.K. today

Total out put of blanks

June 29 1914
 Experiments on Unit No 1.
 8 loaders 4 magnets one
 press 4 planers

Expt to make even pressures
 of powder by rubber plunger &
 diminish the lifting of the
 surface when rubber leaves
 powder —

Press has $7\frac{1}{2}$ inch ram —
 usually we use 700 lbs
 pressure. This makes lifts
 some of the lifts peel off
 main body below the planing
 line all centers lift
 more than edge. Tried 1000
 lbs & let it up very slow did
 no good, some of lifts went
 way below planing off line



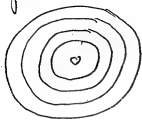
It looks as if Center got very little pressure and trouble was in original loading of the powder too much around edges.

WE tried one at 700 lbs laying tin foil on powder & then pressing with the Rubber. This worked ok a powder did not stick to foil but the lifts were there just the same but not so thick putting hand on foil could feel the lift as if air was under.

WE are now running the scrap on packing machine to load in 1's a grain instead of one man so powder will not pack so much around edges - no tin foil -

After shaving it seemed more

If its shrinking of the
Rubber Could put rubber
on in rings.



Necessarily there would be
spaces bet am afraid they
would get full of powder

Even than the 1 min loading
notices on all this



Edge of lift

perhaps is the
shrinking of
the rubber

think $\frac{1}{2}$ min is better than
1 minute, but too much
lifts —

One packed in 20 seconds
appears better than 30 sec

We now try 14 seconds,

this seems thin lifts —

Our old 4 leaf planer planed
it off good

It looks as if old 4 leaf
planer at 60 Rev was best

The 8 leaf makes too much
air + does something bad
Shaves come too often -

We now change the planes
on machine planes to 4
leaf instead of 8 leaf +
run 60 - to see how it
planes off -

The 4 leaf is much better
its going 60 + old one
40. Think 40 Revolution
of the planing scraper
4 leaf is just about
Right -

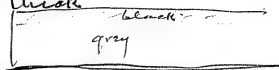
I noticed main lat rubber
pressure off too quick +
all lifts pulled up in
center then



Big teller rubbers off slowly
don't lift so much —

Tried 20 sec loading &
500 grams no better think
it not so good as hit +
pulls out below the ring

I notice that when
ready for Big final
press its one whole
thick



What Causes the black

We now make one of 20 sec loading

4.75 grams + lay one of the 500
1/8 rubbers on powder & then
put in big rubber press
700 lbs —

1-1

$$\begin{array}{r} 360 \\ 4 \overline{) 1400} \\ \underline{120} \\ 200 \\ \underline{200} \\ 0 \end{array}$$

This seems good, more worn
after planing ~~after planing~~
by finger test. There was
one or 2 small pull out
below ring & finger felt
one or 2 soft places
but generally it was better

We duplicate this with
Extra ribbs $\frac{1}{8}$ thick
but put in pieces & bring
up & let off quick.

Rev of table 2 min 50 seconds
Can put 4 on say 4 in 3 min.
This would be 16 for the
4 tables in 3 min or
5 per min for the whole
unit or max of 6600
for 22 hours

The planes scraper revolves
60 Rev -

With $\frac{1}{8}$ rub put on + pressed
wks up + down quick ans
Could look 20 sec

On working quick in
pieces with rubber rubbers
Taking off rubbers +
then breaking up flakes
of the lefts by flat of
both hands. It planes
off good - WE must
break these flakes up as
the planes ~~by~~ blades. but
flakes + break out place
below ring whereas
when flakes broken up
by flat of hand only
powder is taken off by
planes + nothing breaks
below ring + we get
smooth surface

9 timed press with
press man & one on
opposite side they
did 10 in 7 minutes
but they took off &
put in extra rubber &
patted with both hands
the powder after
pressing -

Press man did easy
2 per min & if 2 min
on side extra to pat &
take to plunger table
Can do 3 a minute

Since Centers are light
possibly we can
put a piece of rubber
on the $\frac{1}{8}$ thick

& press center harder
or on plunger in press

Jun 30, 1 AM

What is needed is very
smooth & very flat $\frac{1}{8}$
rubber on powder with
the Reg thick rubber on
plunger of press

Edison No 1

The lot we are now
running there is 20 sec
plg - $\frac{1}{8}$ extra rubber
on powder then press with
Rubber plunger pat pressure
on & off flat as possible
& break up globe by
both hands pressing
down -

Plunger 60 Res table
1 Res in 2 min 50 sec
Will transfer & print
12 at time, they look
good, some are a little dark
around edge on top

Edison No 1 - Transfer
OK III II

Left Ck'd outside ^{near edge} inside marks II
Left Ck'd III
only 58%

But the powder is
heated by water old way
or the War is Reg. Powder
Var -

2nd lot

OK III I
Left Ck'd III 50%
Var Cracked II

Something wrong with the
Powder gas not out of it

Will try + get some clean
heated powder -

+ try it - Loading same
way + try + use same
lot of Vacuum plates -

June 30 1914

and scarcely any on bottom
Bottom gray all over + very
light gray in center -

Test on left hand shows
either that this way of loading
is bad or the powder is
bad having only been water
heated in Vac Drier -

The Vacuum plates we
will use is ^{1st} 362 a 332 Var

The powder is the trouble

We just made 12 blanks
with powder steam dried in
Vac + the blanks showed

perfectly even no black
around edge now

Printed
OK. III III II

100%

June 30 1914

We will see how they
transfer, if good, it will
prove that its the powder
& that it must be heated
by steam to Condense
the Varnish in powder
so it will act as a
Lubricant & pack even

Here are the Transfers from
the steam dried powder 12 Transfers

OK III III I

1 Condensed

XX

100%

This is 1st Real proof that
we must Condense our powder
& therefore must use steam &

June 30 1914

be sure we get right temp & time -
We now use $3\frac{1}{2}$ hours, I think
we must be sure our pressure
is right & to get Margine
Keep it $\frac{1}{2}$ hour longer in
Vac Drier under steam
heat at proper pressure

2nd lot Transfers Same as XX
on back page

OK III III

Comel 1

Small left Crooked. 1

These would have been OK but
for Careless packing -

4/1400
350
1050

1400
42 100

Hoffman Vac Dryers

gives 1200 blanks in 4
hours per round - 6 Rounds
in 24 hours or 7200
blanks 24 hours
3 Vac Dryers 21600 -
no losses of powder

Dryers: 1 1/2 days 1800 lbs
of Resin per Dryer

3 Dryers 5400 -

Another Dryer will do
in in Complete work -

187 lbs Resin for each
1200 blanks -

30 lbs resin in 350 Transfer
(700 plates)

Edison No 1 - with Steam Dried
Powder, using Reg Varnish
without Para + gave on
42 OK out of 47 (transferred)
This Varnish keeps constant
viscosity & does not change
in 15 hours in the room -

The viscosity in above test
was too low only 2 mil 47 sec
then a mistake in Hoffman
was it flowed like water
& Moore thought from looking
at plates that they would
be poor, Centers there then

Another test of E No 1

with Varnish Reg without
Para + 2 ^{400 plates} gives 91% OK
Transfers + 100 painted -
2 Cooked Centers
6 lifts
1 Cooked Van

This shows, as far as transfer
para resin

| | | |
|-----|---------------------|--------------|
| 4 | Loaders - | 8.00 |
| 2 | press | 4.00 |
| 4 | Carriers four piece | 8.00 |
| 4 | Magnet | 8.00 |
| 2 | Extractions | 4.00 |
| 2 | Truck | 4.00 |
| 2 | Extra | 4.00 |
| 1/2 | forum | 2.00 |
| 1/2 | inspector | 2.00 |
| | | <u>44.00</u> |

$$\begin{array}{r}
 2400 \overline{) 44000} \quad (18352 \\
 \underline{24000} \\
 20000 \\
 \underline{19200} \\
 800
 \end{array}$$

$$\begin{array}{r}
 2400 \overline{) 52000} \quad (2165 \\
 \underline{48000} \\
 4000 \\
 \underline{24000} \\
 16000
 \end{array}$$

24-

$$\begin{array}{r}
 2.165 \\
 3800 \\
 \hline
 59.65
 \end{array}$$

6.0

$$\begin{array}{r}
 200 \overline{) 30000} \quad (150 \\
 \underline{10000} \\
 20000 \\
 \underline{10000} \\
 10000
 \end{array}$$

$$\begin{array}{r} 3.6 \\ 2.2 \\ \hline 5.80 \end{array}$$

100 - 5.80

T- 86 OK — 6.74 per 100

Print 92% — 853 " 100

79 left -

Just 80% - 63 left, 13.4 100

86) 5.80 (7.4 37 Returns 12.

$$\begin{array}{r} 79 \\ 88 \\ \hline 632 \end{array}$$

$$\begin{array}{r} 5.80 \\ 6.74 \\ \hline 3.06 \end{array}$$

$$\begin{array}{r} 86 \\ 86 \\ \hline 5.16 \end{array}$$

$$\begin{array}{r} 79 \\ 632 \\ \hline 420 \\ 395 \\ \hline 250 \end{array}$$

$$\begin{array}{r} 86 \\ 86 \\ \hline 142 \\ 774 \\ \hline 140.6 \end{array}$$

$$\begin{array}{r} 63 \\ 853 \\ \hline 223 \\ 189 \\ \hline 340 \end{array}$$

$$\begin{array}{r} 13.5 \\ 774 \\ \hline 79.12 \end{array}$$

$$\begin{array}{r} 13.40 \\ 140 \\ \hline 1200 \end{array}$$

12 Cents - 6 Cent
20 Labor

$$\begin{array}{r} 32 \\ 32 \\ \hline 34.5 \\ 40 \\ \hline 1500 \end{array}$$

$$\begin{array}{r} 34.5 \\ 13.5 \\ \hline 48 \end{array}$$

8000) 160000 (

$$\begin{array}{r} 140 \\ 120 \\ \hline 8 \end{array}$$

$$\frac{225000}{675000}$$

$$\begin{array}{r} 2 \\ 347 \\ 314 \\ \hline 662 \\ 7- \end{array}$$

$$\begin{array}{r} 3.47 \\ 300 \\ \hline 6.47- \end{array}$$

$$\begin{array}{r} 7.74 \\ 75 \\ \hline 3870 \\ 5414 \\ \hline 58050 \end{array}$$

$$\begin{array}{r} 360 \\ 226 \\ \hline 586 \end{array}$$

$$\begin{array}{r} 580 \\ 754 \\ \hline 222 \end{array}$$

$$\begin{array}{r} 645 \\ 45 \\ \hline \end{array}$$

$$\begin{array}{r} 580 \overline{) 7.74} (133 \\ 580 \\ \hline 1940 \\ 1740 \\ \hline 200 \end{array}$$

$$880 \overline{) 160000} (20$$

$$\begin{array}{r} 86 \\ 86 \\ \hline 6246 \\ 7096 \end{array}$$

$$\begin{array}{r} 44 \\ 20 \\ \hline 5130 \\ 5130 \end{array}$$

$$\begin{array}{r} 364 \\ 20 \\ \hline 728 \end{array}$$

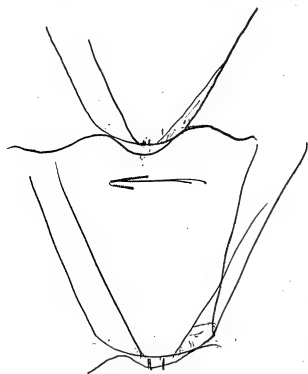
$$5096$$

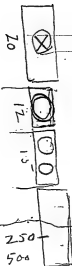
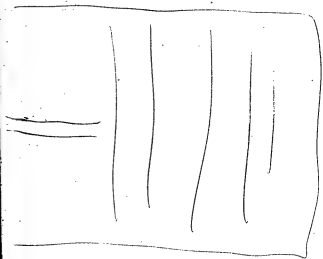
$$\begin{array}{r} 364 \\ 149 \\ \hline 513 \end{array}$$

$$\begin{array}{r} 364 \\ 73 \\ \hline 437 \end{array}$$

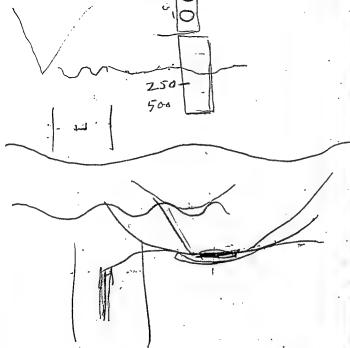
$$\begin{array}{r} 164 \\ 206 \\ \hline 364 \end{array}$$

$$\begin{array}{r} 364 \\ 40 \\ \hline 1456 \\ 3640 \\ \hline 5096 \end{array}$$

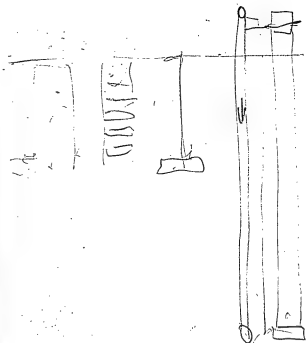
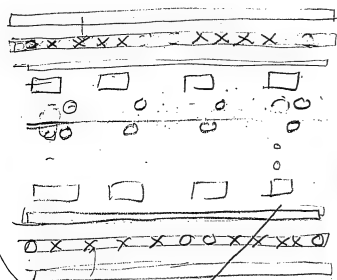




48-
48'



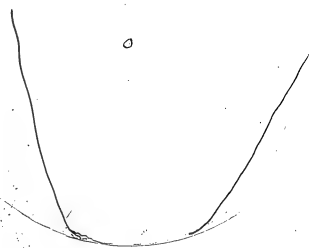
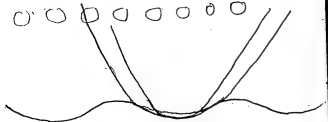
40

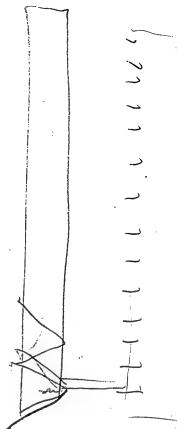
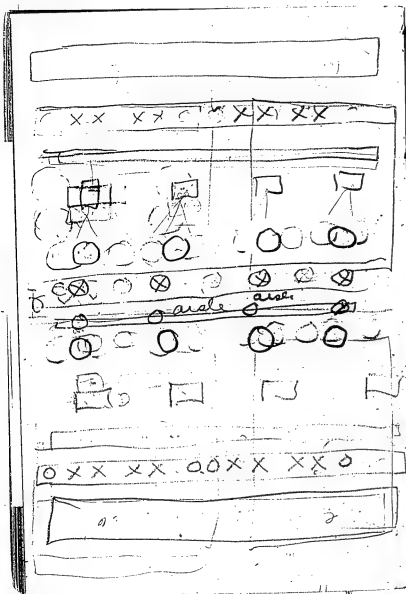


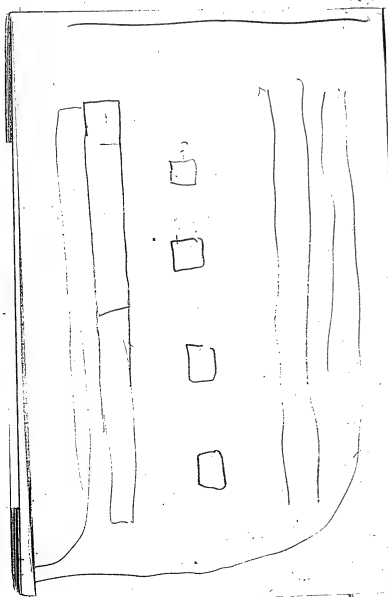
□ □ □ □ □ □ □ □

Truck

40-



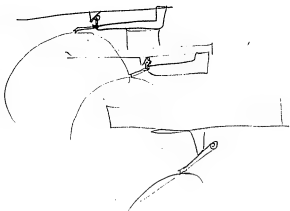
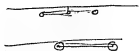




Notebook Series -- Notebooks by Edison
Notebook, N-14-06-00

This notebook contains two undated entries by Edison--a drawing of cylinder phonograph recording or reproducing apparatus and a list of various oils, alcohols, and acids. The entries were probably made in June 1914. Also included is a table, probably prepared by William H. Meadowcroft, of six disc record selections, with data on the number of records ordered and reordered during the period June-August 1914. A final entry by an unidentified experimenter lists four lots of chemicals. The pages are unnumbered. Only five pages have been used.

Only the Edison entries have been selected.



Gasolene
Benzene Pet,
Chloroform
Carbon Tetrach.
Ether
Ethyl alcohol
Methyl "
Acetone
Benzol,
Glacial acetic,
Nitric acid—
Alcohol
Gasoline
Kerosene—
Paraffine oil—
Carbon Disulfide
Amyl alcohol
Carbon Bisulfide

Notebook Series -- Notebooks by Edison
Notebook, N-14-08-07

This notebook was used during the period August-September 1914. It is the second of a four-book series, preceded by N-14-04-30 and continued by N-14-09-30. All of the entries are by Edison, except for some small notations by Sherwood T. (Sam) Moore. Many of the entries relate to the transfer and printing processes involved in disc record manufacture. Included are notes describing results obtained with various experimental varnish compounds. Also included are entries on the synthesizing of phenol (one of the ingredients in varnish) from benzol. These experiments were necessitated by shortages of chemicals formerly purchased from Germany. A notation by Edison complains that he was "Forced to this improvement by the War -- Thus science triumphs over art." Also included is information on the amount of carboic acid on hand as of August 26, 1914, and the cost of chemicals from the General Chemical Co. Additional entries pertain to experiments by Charles T. Dally on patching discard records (cracked or not filled) with varnish and to distillation experiments by Jonas W. Aylsworth and William W. Dinwiddle. Entries toward the end of the book include an extended description of problems with varnish, as well as tabulated results obtained with experimental varnish compounds in July-September 1914. These results include notations of the varnish lot number, the weather, and the percent of successful transfers. The notes indicate that Archie D. Hoffman assisted Edison with his experiments. The front cover is labeled "No 2 Disc." The pages are unnumbered. Approximately 150 pages have been used.

Aug 7 1914

Blank 842-855-

879 2% Para 6% Penta - 7 hours oven

83% Transfer 120 Transfd plate

| | | | |
|------------|-----------|-----------|----------|
| Pullouts | 12 | Reels | 9 |
| Cp waves | 4 | Unwoven | 162 |
| Cks Var | 1 | Ant | 4 |
| Mechanical | 3 | Raised | 5- |
| | <u>20</u> | Disperser | 3 |
| | | Chipped R | <u>1</u> |
| | | | 184 |

Unwoven plate 248

867 Var blank 855- oven 1-2 hours

156 Transfd 75% Transfer to Para 4% Penta

| | |
|------------|----|
| Pullouts | 27 |
| Cp waves | 6 |
| Cks Var | 3 |
| Mechanical | 3 |

All of these
doublefeed nothing
cheeks up

867-V. $\frac{1}{10}\%$ Para 4% Paula

Transfers 70% 2676 Transf'd

| | Plates discard |
|---------------|----------------|
| Pullouts 637 | Bubbles 115 |
| Birds 45 | Unseen 74 |
| Chd Mawar 58 | Dirt 69 |
| Chd Var 27 | Raised 26 |
| Mechanical 33 | Chd 7 |
| | Dumple 115- |
| | Chipped R 37 |
| | <u>437</u> |

Unseen 62%
Patches 73

Another 878 Var $\frac{1}{10}\%$ Para 6% Paula
168 Transf'd 80% RR

| | Plates |
|--------------|------------|
| Pullouts 25 | Bubbles 34 |
| Chd Mawar 7 | Unseen 2 |
| Mechanical 1 | Dirt 2 |
| | Raised 4 |

Council 8
Bubbles 62
Unseen 386

868 Blanks -

25% ground blanks 71% thru 180
75% Reg Process

Transfer 93% - 149 Transf

Pull out 1
Bind 2
Chd Var 6

632 Reg Var

897 blanks -
25% ground Blanks 56% thru 180
75% Reg Process

892 - 92 Transf

Transfer 90% OK

Pull out 3
Bind 1
Chd Var 4
Machine 1

866 Blanks

632 Var 50% phenol resin &
50% Rosin used in blank

100 Transf. 43% OK

Chd waves 6

Chd Var 6

Mechanical 5

Burst out due to blanks 40

Total 57 Discards

880 Var blank 842-855

315 Transf. 84% OK

1% Para 5% Pentra - Plate discards

| | | | |
|---------------|----|---------|----|
| Cooked Center | 1 | Buss | 13 |
| lift | 4 | unrom | 2 |
| pullouts | 23 | Dirt | 3 |
| Chd Waves | 4 | Revers | 2 |
| Chd Var | 6 | Chd | 1 |
| Mechanical | 2 | Dimples | 1 |
| unrom 606 R | | Chd R | 1 |
| | | | 24 |

Prints don't work good
Cracks, May be
black goes some

Bayway Metapara Cream -
35% Formaldelyde - Resin -

Powder Varnish -

12 1/2 lb Resin

27 1/2 lb Nat Alcohol

180 grams 6/4

57 grams Paraphenylene diamine

50 lbs Lead fiber

1 lb Lamp black

Veneer 632 Res Varnish

6 OK - all

899 - Veneer 1 para 8% 6/4 -

6 OK all -

We now print & freeze

Dalkey Expts on Reg 699 -

3.5 mm to 12 mm Viscosity
plates dried naturally & with
heat (air) shows that plates
are more even than ~~and~~ dried
naturally, but more bubbles
but Compel - it appears
to be better all round to
heat dry —

877 Blanks Unbaked

These blanks have been made
from Resin from Matapouri
Cresal from Bay of Air -

12.5 MP resin

27.5 B&H alcohol

632 Repl_{1/2}

180 1/2 grms 6/4

57 " Pine

50 lbs wood f. 6 grs

1 " Locomotive

transfer 100 %

Prints -

OVER

OK

~~Discard puffed edge IIII~~
~~Not full print wood cross~~

Council put puffed some on edge IIII
Council Post print I

We took some of the 877
blank as used in previous
page ~~the~~ Bake (Ran 2 hours
at 730 fah) — There was
puffed edges but not near so
bad as Litho (red)
632 Varinok used

Transfers 12 acc OK 100%

Prints

OK 5

Ducardin Edges puffed up 5

Comel puffed Edge 1

Cracked 1

40% OK —

There is no puffed Edge on these
showing that increasing
from 5% 6/4 to 8% 6/4
has killed this bug

But blank gives poor
prints, ~~that~~ it gives
away at edges w/ pl. mass.

906 Blank

Mix ^{1st} M.P. Casual Bury way
8% 6/4 - 899 Var

Transfer - OK 4
Couch 2 - small point edge flow out

632 Var OK 2
Crkd 1

Comment 3 - Edge blank flow out

Print of 166002 - 632 Var

OK -

Cracked, Edge IIII poor prints

Couch 1

Print of 166002 but 899 Var -

OK 1

Cracked at Edge at poor print 1

Poor print on bl. mass II

Cracked Edge wire II

85

12/100/63
96
4

Bayway MP - 904 Blank -
40% Forward cycle inst to MP -
117 Straight 6% 6/4 - hard power

Transfer 632 Var

OK 5

Discard 1 - pulled out 3" spc.

Prints - None puffed at non filled
ELPS -

OK 411

all are little shy of filling on top
cut off

899 Var Dup of above

Transfer

OK III

Good 1

Discard 1

not puffed on sides

Print

OK III

most have edges not
filled but none OK

Moore inspected. Edges
of 60 rag blank^{20% ragged} only
found one edge burst out
Oxony Metapara too
brittle resin -

Not bottled
909 - Metap Bayway 40% Formed
0.18 1/2 Metapara - 6% 6/4 -

1/2% Para.

Transfers - 903 Varn

11 Released properly
1 Strike

OK. III III

Edges burst out 11

Cracked at edge midpoint 1

Prints.

OK 11

Concl 11 etc

OK Rectified 1

Poor print & Cracked 1111

Cracked top Line 1

Not filled - 11

16% +
poor

Not Baked
910 Lot everything same as 909
except colored more leaning
big for 18 Panes in -

Transfer -

11 released from 18
1 stick

OK. III III

little edges crunched
Much " " "

Prints

OK IIII

Cont. - 11

first line crinkles 11

last fill big Crinkles 1

66% -

but poor - poor fcs
on Edge

OKs are ^{OK} put on edge they don't fill well
Cracked where transfer Cracked out edges

Not baked
911. Same as 909 & 910
Except 10.5% free W Para left in -

Transfer 10 returned freely
2 stuck

OK IIII

Edges cracked and IIII
" " split

Not used if one edge cracked

Prints

OK IIII

11- Poor fill + Cracked IIII
Cracked

12) line crack + poor print II

33% OK but poor

915 Blanks — Not baked —
97 + 98% 17 BarrettUFF 96

7.5 free ~~5.5~~ Van 903 —

2:16 6/4 — on account of small
amount of free MP in resin —
Transfers — 1/2% Pass 5% base —

OK — III III Will print all —
Edgeturn 1
dft. Cracked II — No 2 dye turn 1

Prints.

OK. II —

Puff'd up 2 dyes III
III

Poor print 1

Gives away (Varnish) 1

16%

Wg Not Enough 6/4

12 (20/30) 16

913 Blank Not Eased -
903 Van

97-98 $\frac{1}{2}$ Barnett,
6% straight 6/4

756 pure Barnett $\frac{1}{2}$ Para

Transfers

OK IIII

bad Edge combed IIII

Comel II - as far as blanks concerned
one hole pulled out to blank + 1 big pull out in Van

Prints

OK IIII

Puffed Edges

Poor present IIII

Comel II

41%

12 $\frac{50}{40}$ 41

916 Feldenk Not Colored.

903 Van -

95% Grude Carthia Barrett,
6% slonipat. $\frac{1}{2}\%$ Penn

8.2 Free Cartholic —

Transfer -

OK. III IIII

Edge crushed IIII

Prints:

OK. II

Poor print IIII

None
F Puffed Edge

Coned IIII

Coned double IIII

Cracked due to Poor Print I

50%

$$\begin{array}{r} 424 \\ 8 \overline{) 4012} \end{array} \quad \begin{array}{l} 513 \\ 2 \end{array}$$

We are now trying to make
 Phenol from Benzol. synthetic -
 by the Benzene sulfonamide process

| | |
|--|------------------|
| 75 lbs Benzol. | \$ 2 48 |
| 530 lbs H ₂ SO ₄ | 4 24 |
| Carb. lime. 75 lbs | 0 07 |
| Na ₂ CO ₃ | 0 70 |
| Caustic Soda | 5 56 |
| | <hr/> \$ 13 05 - |

Yield 91 lbs Phenol.

14.3 Cents lb without
labor -

8/19/14

921

50 lbs Mita Para Cresol (Bayway)
20 " Formaldehyde

Yield 35 lbs
Fiber Cresol 17.6%
Resin 13 1/4 lbs

The M, Peroxol resin in #920 is
from run #921

Don't seem to be as good when
Resins are mixed as when
MP + Phenol are made together
in Digester

Reg 903 var

920 Blank - Not Baked

Mixture of 75% MP Bayway resin
with 25% Reg Phenol resin
6% 6/4 straight,
1/2% Para 4 to 1 powder

Transfers OR III III II
All OR 100%

Shift covered Exp 1

Prints -

OR, III II

Poor print + Crack of side 1

Poor print in Music, will reprint 1

Poor print of side crack II

Top of walls broken off 1

12/7° 1/2°
1°

919 Resin in Diqueter
made,

30 lbs MP Cresal Bay Way

10 lbs Phenol

16 lbs Formaldehyde

Made same as we make
Phenol resin

Yield 19 3/4 lbs -

10.3% ~~for~~ MP Cresal -

~~for~~ 40200 49.3%

Promising
83%

Net Balied

918 -

75% MP Bay Way

25 Phenol - in Diqueter -

6% straight 6/4

1/2% Para - 4 to 1

Resin -

903 Varro Vencor

Transfer -
OK III IIII

Edge Cracked !
Slit

Prints
OK III IIII

fine crack Poor print (this card)

Poor print !

Conch !

fine line crack shown !

83%

12/100 83
92
4

Blank

Not Caked

917-

2.24% 6/4 - on 5% cases -

1/2% Poria - 4 to 1

Let No of Van 501 B

917:

Transfers

OK. III III

Print

OK. III

Cover 1

Poor print, broken edge near disc 1

Poor print III

66.6%
+ 3 blank reprint
~~50.0%~~

June 28/94/Blank

1/2 90/66.6
1/2 100/100
1/2 100/100

Not Baked

914

95% Bavaria Crude Carbonic -

30 lbs Crude

12 lbs Formal

4 1/2 lbs NH₄

yield 18 1/2 lbs 8.2% free
Carbonic - 61% yield

Dup of 917 Blank -

still may be overgrown
as the same lot of blank

Transfers

OK. III III

12/7

Another lot of Transfers

Transfers

OK III III III III

100% all OK - none cracked at top

18

Prints -

OK III III

Net filled in Missio II

Poor print on Mangin III

fold line Crack I

Cornel Crack near edge I

Discard by Cornels II

55%

all these 6 Cornels
both sides pass
made at same time

922 A

Not Baked

#919 Resin - 2.9% 6/4

on 5% Base 1/2% Paria 4 to 1

Transfers

OK III III III all OK

Bad Edge Cracked I
Edge .. I

Print 12 -

OK III III II

100%

Dup 922 B - These blocks made later than 922

Transfers OK III III I

Crack I -

91%

Print, OK III III II

Genl Chem Co

Quats, 90 cents 100 lbs
for fumig 504 - 20% SO_2 -
In drums Carload lots

100 Less than Carload
lots 1.15 per 100 lbs

Delivered at Orange

Drum returnable
if in good or bet

30 days or 1% Cash -
10 days —

Dallys Epoxys patching
discards seconds with Plastics
where cracked or lack of fill

Use grey var with 6/4 increased to
10% of Resin & 2% of Para
instead of 1 1/2% —

Printed over crack then ~~was~~
baked records for 1 1/2 hours
150 @ 150 To Goodhue then
pressed in transfer press
between Form 5 plates to
finally harden —

Then Printed Reg

They seem ok & I believe we can
stop discards altogether & rework
with Varnish, Transfers & Prints &
Correct every defect which we
now discard for

Forced to this improvement
by the War — Thus Science
triumphs over war —

Not baked ^{stiff}
922.C - Duplicate of 919^B Resin -
marks in duplicate
Same blank as A+B except Yield 50%
3.04 6/4 - on 5% Basis - 11.1 from MPP in resin -
1-Hydrochloric acid treated
Transfer
OK. III III II 100%

Print
OK. III III
Concl II 100%

Not baked

922C (Dup 919 Bluff)

as on last page its a dup
To let Transfers stand
24 hours before printing

3-04 6/4

1:50 PM 20 Aug

Transfers

OK III III

12-

Cracked!

will hold 48 hours before printing -

Inspected after ¹³¹48 hours

Transfers OK III III

12

Cracked!

will keep 100% ready then unproof print

Prints

OK III III — 8

Porcelain III — 3

No cracks

12) 80 (72
12) 120

Not baked
2.9.6/4 - Lot 919

Transfer to 68 held to acc of Crack
48 hours
Transfiling to 2.39 pm
OK III III } 11 only in the lot.
Cracked blister 1.

After 48 hours rest

Transfer to OK III III -
1 Ck's trace -
Will hold till Monday - inspect & then print
After 135 Hours no cracks seen

Prints OK !!
No cracks.

Bay Way - MP Cressel
4000 cc

15 cc came off below 165 Cent
136 cc " (165) 183-192
201 cc " 193-195
39 cc " 195-195.5
3 cc " Residue

Merck Gives Boiling P

Ortho 187-9
Para 198
Meta 202

95% Barnett (fired in the previous distillate
accounts cook higher Wt. Loss 400 cc
distilled it

95-110° Cent 16 cc - 74 water
189-192 55% 220 cc Spec G 1-034
193-196 150%: 65 cc mostly came off 193-197 Spec G 1-031
196-198 150%: 73 cc Spec G 1-027
Residue black but limpid 20 cc 5%
Total 394 cc 98.5% (a portion used)

Dimethylis distilled it -

97-98% Barnett 400 cc

2 cc came off below 202 Cent
21 cc " 202-206
285 cc " 208-210
60 cc " 210-213
23 cc " Residue

NO 04 Transfers OK III }
 214 Blank Ringlets OK III } 6 -
 will print - slight blurring
 OK Red Center II
 Prints OK III - } 3

Page 12 of 13

well print - slight cluster

OK Red Center 11

Prints OK III - 3

Two Experiments 924. Blank

8 1/2 6/4 1/2 1/6 Pm 4 to 1 Pm and 1/2

$t = 2\frac{1}{2}$ minutes, $2\frac{1}{2}$ min 1000 CG

| | | | | |
|---|---|---|----------------|---|
| 2 | 4 | " | $3\frac{1}{2}$ | " |
| 3 | 5 | " | 3 | " |
| 4 | 5 | " | 5- | " |

$\left. \begin{array}{l} NOI - Tunccegi OK III \\ 92466mk Paluska Chd I \end{array} \right\}_6 = \Sigma q_i C_{i, total}$

Prints, OK IIII } 5-
poor print Council I }

NO2 Transfer OK 11-6
924 Hmd Blister, Ckd 1

Prints OK 1 - } 5 -
Page print II
red line crack II

NO3 Twines OK. |||| } 6
Left cranked }
Warping - Belcher }
Print. OK. |||| } 5
Cranked }

No 4. Transfer OK ||||| 6-

Blister Chd ||

Blister Conch 1 - ng

Cooked Chd OK

Print - OK

Poor print of Conch 1

Poor print, Blister 1

None of -

gus a -

925 Blank

921 Resin

8 1/4 6/4

Temp in Fryer kept
down just to fine powder
4 to 1 -

No 1 2 1/2 mm Contrast 2 1/2 mm 10000

2 4

"

3 1/2

"

3 5

"

3

"

4 5

"

5

"

No 1 Transfer OK ||||| - 6 - Edge Cracked |||||

Print - OK ||

Conch ||

Not quite filled - hence ||

No 2 Transfer OK |||||

Blister Chd ||

Print - OK |||||

No 3 Transfer OK ||

Blister Chd ||

" Chd ||

Print OK ||

26

Notice - no crushed Edges -
Whole blank flows a little

Round

926-Resin - 927 blank

50 lb { 75% 95% Crude Carbolic Barnett
25% Phenol
30% Formaldehyde - } Resin
Yield 20 lbs
Free acid 15.1%
Recovered 12 3/4 lbs

Blank 927 - Varnish in blank powder
6% 6/4 sl. night 1/2% Para
4 to 1 powder Not Caked

Transfer - OK III III

522 lot
923 Varnish -
all prec. solution

Cracks edge faint 1
Big pull out 1

Dolly dont get enough stuff in his
fine deep pull out - or hole.
is full of dirt must get fine
drill + clean it out -

Dolly Repair

Originally Records

Aug 22 1944

White spot.

OK III III III I

Cracks, OK II

Pull out, Discard - III new cracks came in on Pulling

Pull out OK II

It looks as if the repair
process is a great success.
Holes should be cleaned &
sufficient Vee used as on drying
an excess stands about -
Only bad phenomenon is
new cracks show up not
originally in - will find if this
comes in with many bakings of repairs
on the casting

Cresols requires 30 to 40% of
Formaldehyde 40%

Phenol 50 to 60% Formaldehyde

If 100 ^{grams} Cresol used then use
40 gms 40% formal

25 gms Alumina slacc | action
50 gms " quick

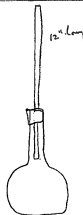
Put back on hot plate Tuesday
9am -

Took off 3pm - drove off on burner
some of the free liquid & when
got to truck stage poured out
on Pie plate -

The high boiling ones is distilled
a give biggest yield -

The residue, I kept an too
long it Condensed -

Residue is best of all for
yield -



30 cc Barnett 95%

12 cc formaldehyde 40%

Put on steam plate -

Dimmoldies Distillation 3 boiling
points,

400 cc

No 1 189-192 - 220 cc

2 193-196 - 65 cc

3 196-198 73 cc

Dimmoldies
Snap it ~~fast~~
before 9pm
Saturday -
Sunday night
Bull!

On at 6 PM Saturday

~~Test off at 10 PM~~

Monday ^{9AM} all Condensed - No 1 clear yellow
No 2 hader + not clear No 3 Hard + not clear

Not Colored -

928 Blank - made of 926 Raisin


4.16% 5/4 - 5% base

1/2 % Pann -


4 to 1 powder

Lot 502 Van

903 Van

Transfers OK - 
all OK -

III. Slight edge cracks

Print OK 

Cornel I

Post print II - probably not fault of blank

Cracked on first line I

Cracked Cornel II

50% without Cornel

75% with Cornel -

919 - Triplicate Bay Way to Check -

37 $\frac{1}{2}$ MP

12 $\frac{1}{2}$ Phenol

20 Formicdehyde

yield 30 lbs 40%

No 1. Sample is principally
ammonium acetate & came off
when still opened up

No 2. Came out 5 minutes
after Superheater was
put on, it was on $\frac{1}{2}$ hour

No 3, is at end of No 2

No 4 is last mostly water
from Superheater -

Run -

929 -

$3\frac{1}{2}$ 95% Barium

$12\frac{1}{2}$ Phenol

$17\frac{1}{2}$ formaldehyde -

$12\frac{1}{2}$ ammonium

yield 31 lbs -

Loss 11.3

Recovered

13.25

6.2% off

88% Recovery altogether -

Daily Repair Expts —

59 to 66 — Not baked but
air dried 24 hours — ~~\$~~
average temp 60 to 65 °F

Poured out on Pic dish

| | | |
|-----|--------------|--------------|
| 103 | 200-202 thin | Wt 26.25 gms |
| 4 | 202-205 | 26.70 |
| 5 | 205-204 | 28.80 |
| 6 | 205-209 | 26.50 |
| 7 | 209-218 | 28.50 - |

At normal Temp all are Viscous

205-209-
+
209-218 } thickest greatest yield

There is considerable free cresols
to come off - to get hard resin -

The Residue uses ok best
when I put on burner
to drive off some cresol it
Condensed to Rubber

Barnett 95 distilled by Dummukh
6 portions 5 clear 1 Residue

30 cc of Barnett 95. 10 cc
Formaldehyde -

On 3 pm - Monday

at 6.20. Residue Condensed
to Resin -

at 9.35 none of the others
have gone off to Resin -
although cloudy when shaken

at 11.30 ^{pm} had to go home took all off
the 209-218 is very thick almost a
resin the next thickest is 205-209 -
the others are still liquids -
tomorrow will put on again -

~~Today~~ Tuesday 9.30 put on
again - at 3 o'clock took off a
heated Batch on Burner burner
drew off till thick -

JWA results of Distilling 97-98 Barrett

| | | |
|----------------------------------|-----------|--------------------------|
| 1 st Distillate | 179-184.5 | Boiling Point 187 to 190 |
| 2 nd " | 185-194 | 191 to 193 |
| 3 | 194-200 | 198 to 199 |
| 4 | 200-206 | 205 to 208 |
| Residue still mostly fluid, cold | | 208 + higher |

Testing Distillates by Nördlinger's Test

- #1 Practically all ortho & some phenols 8.8 %
- #2 Mostly meta & some ortho 37.2 %
- #3 All meta & para 41.8 %
- #4 Some para & Xylenol & higher fluids 10.6 %
- Residue Xylenol & higher phenols 1.4 %

Distillates from making Resin
of 97-98 Barrett
BP 186-190

Mostly ortho & some meta,

Barrett 94-98 25th Aug

Distilled Very slowly by Dimroth

7 different products -
1st not used the other 6 used
30 cc of dist. H₂O mixed with
10 cc 40% formaldehyde -

Residue lumpy &
black -



| 400 cc | | | | |
|---------|-------|-----------|-------|--------|
| No 1 - | 42 cc | Spec Grav | 1.039 | at 26° |
| 2 | 60 cc | " | 1.039 | " |
| 3 | 74 cc | " | 1.037 | " |
| 4 | 66 cc | " | 1.034 | " |
| 5 | 70 cc | | 1.029 | " |
| Residue | 42 cc | | 1.024 | " |

46 cc lost thru Cotten soaked up - Aspirator Etc

Duplicate of

Transfers OK IIII

Small Crack II

Edge Cracked III

930 Blank

919 Resin, C₂

3.32% 6/4 5% Basis - 4 to 1

1/2% Poria -

Transfers OK IIII II

AKOR

Slight crack edge III

Prints - OK. IIII

Residue Cornel I

Cornel I

Poor Print I

Cracked III

50%

Duplicate of 931 -

Transfers OK IIII II

Edge Cracked IIII

931 Blank -

929 Resin -

3.18% 6/4 - 5 1/2 Basis - 1/2 % Resin

4.15 1 -

Transfers - OK IIII IIII

Not Colored

Cracked Edges 1

Lift Cracked II Note some flaws to this blank.

Prints - OK IIII

Cracked II

Poor Print IIII

Mostly in Micro

oozes out (Resin) from beneath

10/40

Duplicate —

Transfer OK IIII

Pull out 1
Cracked Blister 1

Cracked 2 IIII

Not Caked

933 Blank — 929 Pass

6% caught 6/4 — 1/2% Pass 1 to 1

Transfer OK — IIII

Edge Cracked II

Cracked Blister 1

Prints OK IIII

Crack II

Poor Print Cracked III

Blister 1 — same as Transfer,
in worse Poor print II

11 (40/37)
32
7

The others removed from plate
at 1.06 AM Wednesday
Put back on plate at 9:20 am
Wednesday -
2 of them cold were nearly soft
didn't flow when flask put on
side

Took all off 1 run -
#6 is thickest

Poured in till the Casserole
left on hot plate all
night - 9 am Thursday
2" at 12 noon.

2 & 4 are pretty hard
to finger nail but well
penetrable, others softer
5 & 6 softest.

24th Aug

Barrett's 94-99% -
400 cc

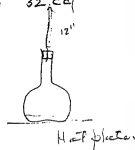
| # | all up to 202° no cooler | 15 cc | Spec 9 |
|---------|--------------------------|-------|-------------|
| #1 | 202 - 204 | 58 cc | 1.039 26° |
| 3 | 204 - 206 | 60 cc | 1.035 26.5° |
| 4 | 206 - 206.5 | 62 cc | 1.035 26.5° |
| 5 | 206.5 - 209 | 62 cc | 1.032 26.5° |
| 6 | 209 - 225 | 63 cc | 1.026 27° |
| Residue | Therm 1/2 above reading | 32 cc | |

- #1 3.75%
- 2 14.5 1/2
- 3 15
- 4 15.5
- 5 15.5
- 6 15.75

Barrett 8.00

48 cc lost from Carls 12%

Put out hot plate 11 am Tuesday -
Residue taken off Tuesday 907 p.m.
continued to soft Residue



Not Caked

934 Blank Resin 929-B-

37 $\frac{1}{2}$ Barriett 95

12 $\frac{1}{2}$ Lbs Phenol

17 $\frac{1}{2}$ Formic acid

12 $\frac{1}{2}$ NH₄ —

26 $\frac{1}{2}$ Lbs yield
8.4 formic acid —

21 lbs Recovered

934-929B Resin 6% 9/10 1/2 pieces
4 to 1 Blank

Transfer OK. VIII

Cashed Edge VIII

Cornel 1

Rediff partially Cornel 1

Big pull out to blank 1

935 Blank 929 B Resin -
2.41 6/4 5% Base 1/2 turn
4 to 1

Transfers - OK III III II
all OK — Cinkler 1/2

On hand Aug 26th 1914
Castalia C.C.

88130 pounds

In store room - { 291 Drums 280 Lbs. net 81480
7 " 330 2310

Building 19 = 12 Drums 280 Lbs 3360

Silver Lake 3 1/2 Drums 280 980
88130

910 Aylsworth - Not baked
Expt.

937 Blank - 921 Resin -

9% 6/4 straight, 1/2% Para
4 to 1

Transfer OK IIII Cracked IIII

big Pull out to blank II 50% -
Left Cracked IIII

No use printing

910a - Not baked
938 Blank 921 Resin

10% 6/4 - 1/2 para
4 to 1

Transfer
OK IIII

Left Cracked II
Hollows won't print I

Print,

Edison On 4 pm
Thursday

alpha Naphthal - quenched at
 CH_2O -

at 8 pm found the alpha Naphthal
Condensed to hard -
I tried with CH_2O & heated
but would not melt. but so fast
it don't do as much in
alcohol but does in
Benzene -

Beta Naphthal
 CH_2O - quenched at



Edison On 4 pm
Thursday

Bay Way MP @ 193° to 195° -
30 cc 10 cc CH_2O - 250 milg Para

Hoffman No 4 bottle of recovered by
superheating Cresal Run in
depressor 30cc 10 cc CH_2O -

Ortho Cresal 30cc 250 milg Para
12 CH_2O - at 8 pm no color change or
apparent action so I added the Para

a Naphtol Condenser,
I put up a new flask 30 grams
Alpha 15 g $\text{CC CH}_2\text{O}$. 300 mly Para
on at 920 for Thursday
at 1040 its nearly $\frac{1}{2}$
Condensed -

Yield about 25 grams
~~There~~ hard brittle resin - nothing
free in it I guess
This all Condensed at 11 pm -

I find its perfectly & evenly
Sol in Alcohol in
which is $\frac{6}{4}$ -

The yield is good & resin
looks fine - nothing
but Water bakes over

This is the most working
stuff of all, its Easy

939 Resin -

25 lbs MP Bay Leaf

25 " Phenols

22 1/2" Formicdehyde

Yield 32 lbs -

Free acid 18.7

Recovered 18.25 lb-

Not (Saks)

943 Blank 939 Resin -

6 1/4 6/4 Street - 2 Pins 4 to 1
Reg 903 V

Transfers OK. III III II

Spill Var Pull out II

Var not hard enough not finish
of the blank =

Blanks not washed at Saks - no crushed edges

Print - OK. III III

OK Camel 1

Poor print Camel 1

100 %

944 Blank 939 Resin
5.21% 6/4 5.6 Resin 1/2/Pano 4 Fol

Titrations OK III III II All OK.

Rel spot material + some large, small, 1

Print -
OK III III

Poor print 1
Poor print 2 small II

Q42 Resin

25 lbs Bayway MP
25 " Phenol
24 1/2 Formaldehyde

57% formaldehyde on phenol
46% on Cures etc.

Yield 31 lbs

Loss acid 18.3
Recovered 12

Not Cured

Q45 Blank Q42 Resin

6% 6/4 strength 1/2 para 4 to 1

Transfers OK III III

all OK -

2 Small holes not closed

Prints OK III III

~~91%~~ 91%

Cracks on 2 edge 1

946-

942 Run

5/6 in - 5.07% 6/4 $\frac{1}{2}$ para 4 to 1

Transfers OK. III III //

Cracks Edge //

all OK

Prints OK - III III

2 bad vacuumish -

947 Blank 939 Resin -

6.21 1/2 6/4 6/1 Basis -
1/2 Para 451 -

Transferi - OK III IIII all ok -

Prints OK III IIII all ok

948 Blank 939 Resin

Same as 947 —
but 20% ground powder —

Transfer OK. |||||

Lift Cracked ||

Prints OK |||||

Cracked on Edges 1

Not Caked
949 Blank 919 Resin

50% 919
50% Phenol Resin -

5.9% 6/4 6% Basco - 1/2 Para 4ft 1

Transfer — OK III III II Good Step
OK OK -

Prints OK III II

Poor print III

Evidently 6% Basco too
high!

258 old excel blanks
Old ~~419~~ Blanks Reprinted.

OK III
fordline crack II

New labels don't work on old labels - must
reprint with old labels, otherwise
shows both labels -

950 Blank 921 B 50% Cressa
50% phenol resin - make separate
units together in the furnace
6% phthalic 6/4 1/2 Para 4 to 1

Transfers OK. III III

Lift Cracked II.

Prints OK. III III

Comes
Cracked II

951 Blank 66 2/3 Cresal MP Resin
made separate
33 1/3 Phenol Resin made separate
6% 6/4 2 Crocington 1/2 Para 4 to 1

Transfer OK. II

2 ft Cracked III

2" pulled off II

Cooked I

Cooked OK I

1
NG

Prints OK III

Left Cracked II

Poor Print II

had him check II

2 unprinted

954 Blank

Not Eased

40% Cresol Resin Bay Wax

6% 6 1/4 60% Reg Phenol resin
straight — 1/2 Para 4 to 1

Transfers Resin made separately

OK. III III II

all OK —

High temp seal

Prints OK. III III II

all OK

100%

953 Resin ~~bars~~

1050 lbs MP Baylon

399 " formaldehyde - 38%

yield 736 lbs resin
70.5 lbs isocyanate

13.8% isocyanate in resin -

23 3/4 hours working 1 1/2 hours
unloading - Resin very thick

took 40 lbs air pressure to

unload -

Reaction very wild, run up to
250 lbs in 5 min Safety Valve

Lifted out some scum

954 Blank 953 Resin -

40% MP Resin

60% Phenol Resin - 6% 6 1/4 straight
4 to 1

20% ground glass in it

Transfer OK. III III II.

2 were ng but no fruitless

Prints - III III, OK - 2 not printed -

958 Resin -

1050 lbs Benzoyl

367.5 lbs Formic aldehyde 35%

Recovered 256 lbs

Fresh Cereal 16.2%

Reaction wild, pressure went from
20 lbs to 110 lbs in 15 min

Came back to 80 lbs. When
dribbling off with pressure
was down to 20 lbs -

the reaction started over &
pressure went to 80 lbs
again -

Time 23½ hours 35 minutes
to unload to 30 lbs over

pressure Resin thick & heavy
Transfer OK UM UM 11 all OK

959 Resin.

Recovered Cereal from 953 + 958

Used 50 lbs Cereal

17.5 Formic aldehyde 35%

Yield 29 lbs

Recovered 21 lbs

Free resin 8.5 lbs -

Reaction very wild highest point

95 lbs pressure with steam on
jacket - 9 hours to make resin
½ hour to unload -

Transfer OK UM UM 11 all OK

Top Trays of (crack)

90's Lat 540 9/19/14

Blank 542-954 - 7 hours

302 Transfd

192 OK

110 Discarded

Left cracked 1

Pull outs 84

Cracked covers 3

" Vacuum 2

Mechanical 4

Print Top
Chd on Margin 36

" - None 2

Press prints 192

Total Printed 192

OK 151

73%

63% OK

Bottom Trays same as above

237 Transfd

95 OK

142 discarded

40%

Pull outs 100

Chd Van 41

Mechanical 1

Bottom Prints

Total Printed 95

OK 77

Press Print 1

Chd Margin 16

Chd in Margin 1

81%

962 Blank Saw dust in sealed can
from Salomon presumably Southern Pine
5% Roamer 4 1/2% covers 1
Not done

4 runs 53% went (over 180 weeks 96%)

Then 30 weeks - 1 Blank stop (break)

20% ground 6 Cans (over)

Transfers OK None -

Cracked III IIII

Red spots OK II

Pull out to break II -

Welds OK - Blank square round
at Edges & gives corey -

Dep of 962 without 20% ground blue

Transfer OK 1

Cracked by Edges giving way IIII

Left OK II

Shows Rosin in
wood pulp bad

Sept 22 - We have been having very poor results since shut down on Labor day - Up to 5th transfer were averaging 88 to 90 & pencils 85 or more, then shut down & did nothing for 4 days when started up transfers only 50 to 65% & enormous number of pull only by means of air. Records were run it down to penita it was the last of a big batch we had - the batch last more than a week & they are kept hot all the time & each day we take out what we want.

Thinking that perhaps Ferric Chloride was lacking in Penita I made batch Vermah 10 gallons & made 300 transfers containing $1/4\%$ of FeCl_3 to 100% of Resin - The results were horrible & had only got 16% good rest all pulled out, at the same time I made

this Experiment I thought perhaps
it wanted free acid the
Penta always has free acid
so I used the bad penta as
with felt but left that out
& added $\frac{1}{8}$ of 1% of to 100%
of Resin & can handle it.
300 Transfers got 95% and
only one pull out would
have got 100% good but there
was some cracked work
due to bad flowing of
Varnish so this Experiment
shows we want free acid
I used HCl.

We changed the old lot &
started used to catch of Penta
& this is working off 85%
It has free acid as Hoffman
was told to use 3% of acid
to get rid of the lime they
put in it at Mill & Chem
wash out the acid - He uses
HCl in Porcelain lined Kettle

After he gets thru & washes out
the acid, he uses it but there is
some acid # He will stop
keeping it melted the whole
week & will only heat up to
soften whiles he takes what
he wants & then put goes
on & let it cool down this
prevents the putrefaction from being
cooked to death

Tonight I took some of the
putrefaction just as it comes from
mills & find it full of
acid also very much brown

I find that for hours you
can keep it just warm &
stir period in water &
the vrow still comes out
it seems to have an unlimited
capacity for holding ~~the~~
acid

If the vrow is to be got out
must have a stirrer run

by power & frequent changes
of water - its not necessary
to boil the water as Trichlorophyl
comes off -

I have told Jwa to tell Hill
stop putting lime in Pent
if they ever did - its not
necessary. Old pent worked
good & did nt have lime in
It says its used to diminish
the acid so they could
ship it.

Also tonight Jwa said if I
put acid in the alcohol the
6/4 would give off its
ammonia & free the formaldehyde
I find that neither in alcohol
or water, saturated with
6/4 does the addition of
HCl give slightest smell
of formaldehyde

I find if C_6H_4 is dissolved in alcohol that the addition of HCl throws down has like crystals of a salt. I thought this was NH_4Cl but on heating it enormous volumes of smoke comes off which is pungent & a large residue of Carbon remains. The Crystals are pure white that comes down.

Some of the Crystals are soluble in alcohol & do not come down on evaporation gives white residue I had an excess of acid.

Suddenly C_6H_4 combines with HCl to make a salt very soluble in water but not near as sol in alcohol as C_6H_4 but on account of large

Find the HCl combines with
the Para in Alcohol making
it far less soluble but
I think the Alcohol is in
such excess that it
will not precipitate out
I will find this out.

amount of alcohol we
use, there will be no
precipitation,

I have weighed out

145 grms Alcohol

8 " 6/4

1/2 " Para No penia

125 milg HCl which is precipitation
used in experiment where got good
results. - There is no precipitation

I now make 2 more balances
as above

No 2

has same as above but
HCl increased to 250 milg

No 2

Dup increased HCl to 1 gram

By mistake 1, 2 & 3 gram
alcohol used instead
of 145 grms -

145 gms Alcohol
2 gms Para
250' wdg HCl-

Want to see if $1/4\%$ HCl
will precipitate the Para

Ng He used grain
alcohol which don't
work like Denatured

No 2 in filtering Alcohol
Shows that 1 gpm or 1%
HCl is a little too much
as there is a slight residue
on filter paper, its brown
& must be the HCl comb
with para & it gives a
few crystals of the white
mass like Eng -

It may be an impurity in the
Para which is crude para

Now using Denatured

No 1 -
145 grams Denatured
8 " $6/4$
 $1/2$ " Para CP from Dethan
1 " HCl-

Am not need to test paper

Acts different from grain
no precipitate -

NO 1 (Continued) - The solution
is just tinted red & no color
as if anything comes down
can be said,

There is no precipitation
showing that the precipitation
of brown stuff is due to
impurities in the crude
Para used by us - it
darkens when acid is
put in but can still see
thru it -

So this proves we can
use up to 1% of Hydrochloric
acid in our regular
Varnish without precipitating
anything out.

Providing HCl is put
in last after 6/4 &
Para has been dissolved

I think there is more than we
need, we used 125 mils but
or 1/8 to one percent of the
Varnish we got up & on wall
from - but of course the Para
had some HCl in it so may
have reacted but it couldn't
be great. Think
with Para we added free of
iron that 1/2 percent
of HCl will be enough
perhaps 1/4 will do, I
will try it.

We tested used Para
from W. & A. & found
no like as stated by
JWA -

Later NO 1 I found on
standing precipitation
of brown sediment
just like Reg Para

No 2 is 145 alcohol
 8 6/4
 2 pure Para 10H
 1 HCl-

On pouring in HCl gets black
 Cant see HCl -

When the Para is in excess
 of the acid as above
Nothing comes out

Evidently the Para should
 not be entirely neutralized

No 1 still keeps throwing
 down brown precip
 after filtering twice the
 filtrate gets cloudy

Either the acid or some
 reaction goes on slowly, &
 Para pouring it out when
 acid gradually expands Para

I tried alcohol containing
 with Chloroform & then but in
 HCl had to use considerable
 but finally white HCl
 came down but not like
 the beautiful needles as
 when 6/4 is used -

There is a little cloud
 but with HCl comes
 with 6/4 to form
 a good compound
 Not nearly as soluble as
 as 6/4 but plenty to get
 Enough of the compound
 in the vacuum if it will
 work -

The precipitation from 142
 is getting very small but looks
 as if most in No 1 precipitate & very little in #2

1
later than No. 1 with 2-
grams L.P. Deion. & 1 No. 1
after a white precipitate
brown clearly stuff at
the more & better it but not
near as good as No. 1 with
only $\frac{1}{2}$ gram L.P. Deion.

the L.P. & it is
to come out on 1/2 gram L.P.
as No. 1.

It is only 10 grams
the 1/4 bit only in a sample
could not develop in 1/45
gram in cubit or anywhere
near it in Gold-rem
now covering it.

Req Var with $1/8\%$ of Hydrochloric
Acid Conc 10 gals Var made -
Made same way as for open -

Flowering Room 982 54513

Var did not work good, great
many dummies & lot of packing
up - Room temp 77° Viscosity 70
5.05 Temp of Var 86°

Req Chloroform -

Made 274

OK 236

Dis 38

Lifted 4

Pull out 1

Cracked 33

86% S.S

Presets 236 Printed

41 Discards -

195 OK.

82% with all

discards

226 are mostly OK

others not due to Varnish

Discards

Pull out Margin 3:

Cracks 29

Poor Print 2

OK 100% 7

Cracked - Margin 3

95.7%

Here is record of test with (1)
Penta Cooked several days -

Sept 20 - Spel Var 981

Req Var with $1/4\%$ of Ferric Chloride
to 100 of Resin -

10 gals made - Used 150 Alcohol to
100 Resin - Viscosity 3.17 room
temp 100° Varnish made in open
where we lose some alcohol

Flowering room 981-54413

Var 10 hrs after did not know any breaking up
room temp 94° Viscosity 70° 3.41 min
Temp of Var normal 88°

Transfer very poor due to plate

Very poor fine scale

Req Penta Cooked 300 made

OK 49

Discards 251

Lifted 20

Pull out 231

Prints 49 printed

10 Rejected

1 Blank
1 Corroded
1 Poor
6 Chipped

1 poor print

8%

16% OK

93.4%
S S S without
pull out

Made up a Vacuum
145 at 20°C

10 6/4 HCl comes out only about
6 drops. No pain or Paula
Condensate on boiler plate.
quite so guess there is
no doubt about a HCl 6/4
Salt that is as good as
6/4 + Cl. will be some
of ammonia when completely
May not count either
Penta of Penta - Vacuum very
thin -

Seems lots bubbles
+ acts bad -

Sept 23 & 24th Penta now used
tested by us Moore No 2
was practically free from
acid and iron - scarcely
a trace of either, put in HCl
to see if any metallic Fe
there was none, washed
acid out,

No 1 Edison is the Raw
sluff from Wyandotte
had lots acid & iron
washed it free - 6
bath -

Penta old dials nearly
all in Belling Petroleum
Benzene if filled leaves
residue & solution dark
but if bone black used

its a very light tint of red
+ OK - will see if what
described is what we want

Moore's No 2 after firing
is very much harder
than Edison No 2

No time was in either -

New Batch Pentol.
3/4 lb. boiled - washed free acid, has very
little brown in it - its very stiff say

903 - Van lat 546 - Blank 542-907
Open mixed of hours
Transferred 3871
OK 3378
Ducroix 493

Lifted 13
Pullouts 285
Buds $\frac{41}{326}$

Cracks & cones 63
" Varnish 57
Mechanical defects 341

87 1/2

Michael Export. to washer
 Alcohol - Spal Var 983 -
 Var 547 - Blank 542-907
 even 8 7 hours
 Total Transfer 366
 OK 25% -
 Discards 111

Left Chd 1
 Pull Out 88
 Chd Wave 20
 Mechanical 2

69%
 937, 938
 939

Print, 983 - ~~2~~

Printed 256

Prints OK 220

Discards 33 - Not printed 13

Chd in Music 11
 Chd in feed line 14
 Chd on feed line 2
 Poor print 6

87%

Old Peter

903 - Var 548

542-907 mixed scores 7 hours

Tireyford 1986

OK 1291

Discards 645 -

Left Chd 7
 Pull Out 603
 Chd Wave 29
 Chd Wave 47
 Mechanical 9

65%

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Dup of 982 -

982-551 Var this is dup of 982 modern
Sept 21/14 Except new Pentin, new Room

18% of Hydrochloric Acid
Alcohol 14.2% Viscos 3.10 Room Temp

109 Fahr

Flowing room - Flowed Sept 24/14
at 7:30 am all day run -

room temp 86° Fahr Temp Var 88°

Viscos at 70° 3.57 am -

room temp 92° Temp Var 90° Viscos

at 70 4.28 PM -

Flows good - Remarks better

results from this lot of Var

than I had from 545 B. Leach

was covered Sept 22 not away

double breakage - Very few

thin edges in fact Var is good grade

Transfer 5075 -

OK 2983

Discards 2092

Left Chd 11

put out 1830

Cracks 209

Mechanical 45 -

58%

94.8%

withered lefts

Resin / Varnish

| Sept | Resin | Added | % Transfer | Temp Flowing Room |
|-------|-------|-------|------------|-------------------|
| 1. | 18.4 | 36 | 89 - 88 - | |
| 2 | 18.4 | 36 | 90. | |
| 3 | 17.9 | 41 | 91. | |
| 4 | " | | 92 | |
| 8 | " | | 78. | 53 |
| 9 | " | | 73 | 76 |
| 10 AM | " | | 77 | |
| 10 PM | 19.3 | 2.7 | 83. | |
| 11 | " | " | 75 | |
| 14 | " | " | 59 | |
| 15 | " | " | 68 | |
| 16 | 18.6 | 3.4 | 73 | |
| 17 | " | " | 81 | 80 |
| 18 | " | " | 85 | |
| 19 | " | " | " | |
| 20 | " | " | " | |
| 21 | " | " | 83 | 82° |
| 22 AM | " | " | 87 | 89 |
| 22 PM | 17.1 | 4.9 | 65 | 84 |
| 23 | " | " | 79 | 84 |
| 24 | " | " | 61 | 84 |
| 25 | 16.9 | 5.1 | | |
| 26 | " | " | | |

Hel Sept,

Notes -

Alcohol in Varnish varies from
115% To 180% Resin -
to 155% & yet. got good results
so there is no appreciable
bad effects from more or less alcohol
but about 142% appears
best - This is from all
the data for 2 months, over very
good & very bad periods -

When there is a high percent
of OK lacquer, there is from
4 to 10 times more cracked
transfers than pull out transfers.

When there is a low percent of
OK lacquer - it is just
the opposite, there are from
4 to 8 times more pull out,
than cracked lacquer transfers -
The cracks don't vary much

| Sept | | Incub in NY 102 after Bureau | | | |
|------|------|---------------------------------|--|--|--|
| | 7 AM | 7 PM | | | |
| 1 | 70 | 81 | | | |
| 2 | 73 | 86 | | | |
| 3 | 75 | 75 | | | |
| 4 | 67 | 66 | | | |
| 5 | 57 | 71 | | | |
| 6 | 61 | 72 | | | |
| 7 | 69 | 73 | | | |
| 8 | 55 | 60 | | | |
| 9 | 50 | 60 | | | |
| 10 | 49 | 65 | | | |
| 11 | 53 | 59 | | | |
| 12 | 57 | 59 | | | |
| 13 | 58 | 60 | | | |
| 14 | 57 | 60 | | | |
| 15 | 60 | 63 | | | |
| 16 | 62 | 69 | | | |
| 17 | 61 | 76 | | | |
| 18 | 68 | 82 | | | |
| 19 | 68 | 63 | | | |
| 20 | 60 | 73 | | | |
| 21 | 64 | 86 | | | |
| 22 | 73 | 80 | | | |
| 23 | 71 | 80 | | | |
| 24 | 74 | 68 | | | |
| 25 | 58 | 64 | | | |
| 26 | 50 | 58 | | | |
| 27 | | | | | |
| 28 | | | | | |
| 29 | | | | | |
| 30 | | | | | |
| 31 | | | | | |

It appears as if there was
no connection between the
amount of fresh phenol in
Resin, 16% or 21% - one gives
as good results as the
other of course so afterwards
added to bring all to
22%

15@16% appears to be
the best amount to leave in
The Resin & then add phenol
to bring to 22% - $\frac{1}{2}$

632 Van ^{100%} OR Transfers from following Vans

Alcohol (Machinist)

| | |
|-----|-------|
| 382 | 145 |
| 383 | 145 |
| 386 | 145 |
| 387 | 125 * |
| 391 | 148 |
| 394 | 145 |
| 395 | 145 |
| 397 | 145 |
| 398 | 148 |
| 403 | 148 |
| 406 | 148 |
| 407 | 125 * |
| 408 | 145 |
| 409 | 145 |
| 412 | 148 |
| 418 | 148 |
| 431 | 130 |
| 439 | 145 |
| 440 | 145 |
| 442 | 145 |
| 443 | 148 |
| 446 | 155 * |
| 452 | 155 |

102

60

60

70

14.4

18.6

20.1

20.1

903 Van

17.7

17.6

17.6

17.6

17.9

17.9

17.9

17.3

17.8

17.8

17.8

17.9

17.9

17.9

17.9

17.9

17.9

17.9

17.9

17.9

632 Van

2% Para

7.9% 6/4

4% Penta

Transfers OK Below 75% -

903

Alcohol (Machinist)

| | | |
|-----|-------|------|
| 529 | 142 | 17.9 |
| 530 | 142 | " |
| 532 | 142 | " |
| 531 | 142 | " |
| 534 | 142 | 19.3 |
| 535 | 136 x | " |
| 536 | 136 | " |
| 537 | 150 * | " |
| 538 | 150 x | " |
| 539 | 142 | 18.6 |
| 548 | 136 x | 17.1 |
| 549 | 142 | 17.1 |

632 Van

434 140 63

854 Van

433 115 *

456 155

981 Van

544 150

983 Van

547 136

984 Van

550 152

903 Van is

1/2% Para

8% 6/4

6% Penta

Ratio of Pull outs to Cracked Transfers

[illegible]

July 22 Turned + there was
3 to 8 times more pull over
than Crooked -

Lots of Penta

| lot # | Invol | Used up | |
|-------|-------|----------|----|
| 28 | 20.8 | July 9 | 7 |
| 29 | 18.4 | 16 | 6 |
| 30 | 24.6 | 22 | 7 |
| 31 | 18.9 | 29 | 6 |
| 32 | 17.8 | Aug 5 | 3 |
| 33 | 17.9 | 8 | 4 |
| 34 | 29.4 | 12 | 5 |
| 35 | 22 | 17 | 7 |
| 36 | 24.3 | 24 | 9 |
| 37 | 20.4 | Sept 3 | 19 |
| 38 | 21.9 | 22 | 5 |
| 39 | 21.2 | 27 | |
| 40 | 21.1 | now used | |

| Room where Varnish kept | | | | | | | | | |
|-------------------------|--------|--------|---------|-------|---------|------|----------|------|------|
| Aug | 1/2000 | Temp | Room | where | Varnish | kept | Humidity | Temp | Room |
| 1 | 88 | 93 | 89-91 | 73-76 | 67 | 55 | 50-80 | 67 | 55 |
| 3 | 92 | 84-82 | 73-79 | 73 | 47 | | | 73 | 47 |
| 4 | 82 | 80-91 | 75- | 67 | 68 | | | 67 | 68 |
| 5 | 81 | 82-92 | 71- | 64 | 63 | | | 64 | 63 |
| 6 | 88 | 82-100 | 72- | 67 | 72 | | | 67 | 72 |
| 7 | 77 | 92-98 | 96 | 47 | | | | 96 | 47 |
| 8 | 73 | 88-101 | 98-100 | 60 | 48 | | | 60 | 48 |
| 9 | 87 | 93-97 | 103- | 64 | 31 | | | 64 | 31 |
| 10 | 81 | 85-92 | 83 | 77 | 36 | | | 77 | 36 |
| 11 | 84 | 81-92 | 105-103 | 51 | 60 | | | 51 | 60 |
| 12 | 93 | 90-98 | 100-109 | 76 | 78 | | | 76 | 78 |
| 13 | 84 | 87-95 | 109- | 78 | 69 | | | 78 | 69 |
| 14 | 89 | 80-100 | | | | | | | |
| 15 | 94 | 93-93 | | | | | | | |
| 16 | 87 | 91-91 | | | | | | | |
| 17 | 95 | 89-89 | | | | | | | |
| 18 | 93 | 83-83 | | | | | | | |
| 19 | 93 | 83-93 | | | | | | | |
| 20 | 93 | 77-79 | | | | | | | |
| 21 | 94 | 76- | | | | | | | |
| 22 | 93 | 74-81 | | | | | | | |
| 23 | 94 | 77-83 | | | | | | | |
| 24 | 94 | 77- | | | | | | | |
| 25 | 89 | | | | | | | | |
| 26 | 84 | | | | | | | | |
| 27 | 89 | | | | | | | | |
| 28 | 82 | | | | | | | | |
| 29 | 83 | | | | | | | | |
| 30 | 85 | | | | | | | | |
| Sept 1 | 85 | 81- | | | | | | | |
| 2 | 88 | 88- | | | | | | | |
| 3 | 90 | 89 | | | | | | | |
| 4 | 94 | 83 | | | | | | | |
| 5 | 92 | 72-75 | | | | | | | |

It looks as if it was good
to mix Varnish in a
warm room say 100 Fahr

No Varnish after
Sept 18th

Temp flowing room

| | | | | |
|----|-------------------------------------|---|------|-----------|
| 90 | 81-90-93-89-84-88-86 | % | Temp | Transferr |
| 89 | 65, | | | |
| 88 | 87-84-86-70-42-88-67-65-77 | | | |
| 86 | 95-92-87-92-84-88-87-88-83-79-82-78 | | | |
| 84 | 85-90-87-66-64-78 | | | |
| 83 | 90 | | | |
| 82 | 90 91-93 | | | |
| 80 | 90-90-94-88-86 87-92- | | | |
| 78 | 90-89-90-93- | | | |
| 76 | 92-95-92- | | | |
| 74 | 80- | | | |

It seems as if temp of flowing
room was of little consequence
as long as it is above 76 Fahr -

Low % of OK Transfers

| | 903 Var |
|-----|--------------|
| | Phenol Resin |
| 529 | 17.9 |
| 530 | 17.9 |
| 531 | 17.9 |
| 532 | 17.9 |
| 534 | 19.3 |
| 535 | 19.3 |
| 536 | 19.3 |
| 537 | 19.3 |
| 538 | 19.5 |
| 539 | 18.6 |
| 548 | 17.1 |
| 549 | 17.1 |
| | 854 Var |
| 433 | 17.1 |
| 456 | 20.8 |
| | 981 Var |
| 544 | 18.6 |
| | 632 Var |
| 434 | 17.1 |
| | 983 Var |
| 547 | 17.1 |
| | 984 Var |
| 550 | 17.1 |

6% Penta
8 2%

It would seem that Resin with 15@16% free phenol in resin would be best
If 15% then 7% unacted upon Phenol would be added to make up the 22% wt. always use in Varnish

632 Var. has 4 penta 2 para
903 " " 6 Penta - 1/2 para

High % of OK Transfers

| | 632 Var |
|-----|--------------|
| | Phenol Resin |
| 382 | 16.8 |
| 383 | 16.8 |
| 386 | 16.8 |
| 387 | 16.8 |
| 391 | 16.9 |
| 394 | 16.9 |
| 395 | 16.9 |
| 397 | 16.9 |
| 398 | 16.9 |
| 403 | 16.8 |
| 406 | 16 |
| 407 | 16 |
| 408 | 16.8 |
| 409 | 16.8 |
| 412 | 16.5 |
| 418 | 16.5 |
| 431 | 17.1 |
| 439 | 17.1 |
| 442 | 18.4 |
| | 903 Var |
| 500 | 17.7 |
| 501 | 17.6 |
| 502 | 17.6 |
| 503 | 17.6 |
| 504 | 17.9 |
| 505 | 17.9 |
| 506 | 17.9 |
| | 632 |
| 443 | 18.4 |
| 446 | 18.4 |
| 452 | 20.1 |

| | 903 Var |
|-----|--------------|
| | Phenol Resin |
| 507 | 17.3 |
| 508 | 17.8 |
| 509 | 17.8 |
| 510 | 17.8 |
| 523 | 18.4 |
| 528 | 18.4 |
| 526 | 17.9 |
| 527 | 17.9 |
| | 854 Var |
| 385 | 16.8 |
| 389 | 16.8 |
| 393 | 16.9 |
| | 903 V |
| 546 | |

Box # *from Phenol in Resin 2*

| | | | |
|------------------|------|-------------------------|-------|
| 382 To 390 | 16.4 | Average % good Transfer | 90% |
| 391 To 398 | 16.9 | " | 92% |
| 399 To 403 | 16.8 | | 88.8% |
| 404 To 407 | 16 | | 88.5% |
| 408 To 410 | 16.6 | | 91 |
| 411 To 424 | 16.5 | | 86.7 |
| 425 To 430 | 17.1 | | 85 |
| 431 To 437 | 17.1 | | 77.8 |
| 438 To 441 | 19.1 | | 86 |
| 442 To 448 | 18.4 | | 89.8 |
| 449 To 453 | 20.1 | | 89.3 |

Trichlorophenol never tried in Dye Vat

It combines with NH_4 from saturated alcoholic sol of NH_4 to a precipitate in color but sol in alcohol

Trichlorophenol very sol in alcohol

By saturating alcohol with 6/4 & then putting in strong sol of Trichlorophenol there is no precipitate - it does not take the ammonia from 6/4 apparently, gives clear solution

Apparently Trichlorophenol will absorb the NH_4 when 6/4 is acting -

Trichloro is a great spawning Cupulagid -

Notes

Trichlorophenol strong does not precipitate Paraphenylenediamine strong when poured into it. The solution becomes ~~white~~ darker - but not very much.

None of the ingredients precipitate out Trichloro, 6/4 para,

Even the Trichlorophenoxide of NH₄ does not precipitate -

Strong sol of 6/4 in Al is precipitated in long silky needles by Hydrochloric & these are not nearly as soft as 6/4, they are not NH₄Cl but a true compound with itself. Don't think more than 5% will dissolve in 145 alcohol.

This substance is very valuable in analysis -

Notes -

I find that Pentol dissolves after all that Alcohol will take out warm 110 Fahr. about Will if Phenol pure is added the whole of residual dissolves but when Alcohol is added most of it precipitates out but a large part remains in solution & if filtered off is deep red. If now more Alcohol is added to clear red solution there is no further precipitation.

showing Phenol aids greatly to dissolve more Pentol - if this substance is good.

~~Then~~ Then 15% Phenol in Resin or lower will be best then we can use 7% Phenol free in the Alcohol & this gets more after is residual.

Notes

I don't think G/4 + Trichlorophenol combine as apparently they crystallize out separately but not sure -

The Trichlorophenolate Nthly Crystallizes in fine common rosettes -

Trichlorophenol + Para possibly crystallizes together somewhat but not certain

G/4 seems to condense Trichlorophenol slightly -

Note that the Varnish made with Trichlorophenol instead of Pentol dries slower - also shows tendency to make bubbles -

We need an insoluble lot of Pentol from Michigan - I find if we put pure phenol in it it semi-desolates, when heated, then keep adding alcohol & keeping almost boiling you can keep on adding alcohol at finally on filtering practically all desolates & no amount of dilution with alcohol could precipitate it - Also as if phenol combined with it & then it was sol in alcohol - The reason it doesn't desolates in alcohol is probably due to fact all the phenol used in chlorinating pot was chlorinated so here as the Sol Pentol has prophenol in & to this that makes it Soluble - I once tried Pentol with G/4 & found it partially condensed this

probably proves that there
 is ~~no~~ phenol in ~~oil~~
petroleum is a big find -

My Weather Bureau

| Sept | Humidity | 8AM | 8PM |
|------|----------|-----|-----|
| 1 | 77 | 79 | |
| 2 | 87 | 82 | |
| 3 | 81 | 76 | |
| 4 | 55 | 64 | |
| 5 | 68 | 48 | |
| 6 | 74 | 83 | |
| 7 | 86 | 43 | |
| 8 | 73 | 49 | |
| 9 | 67 | 55 | |
| 10 | 75 | 47 | |
| 11 | 67 | 68 | |
| 12 | 64 | 64 | |
| 13 | 55 | 66 | |
| 14 | 64 | 63 | |
| 15 | 67 | 72 | |
| 16 | 46 | 47 | |
| 17 | 60 | 48 | |
| 18 | 64 | 31 | |
| 19 | 61 | 79 | |
| 20 | 78 | 57 | |
| 21 | 47 | 36 | |
| 22 | 51 | 60 | |
| 23 | 76 | 70 | |
| 24 | 74 | 64 | |
| 25 | 78 | 60 | |
| 26 | 62 | 44 | |
| 27 | | | |
| 28 | | | |
| 29 | | | |
| 30 | | | |

| Var Lot # | Date Recd | Remarks | Trans % | Lot | Date Recd | Remarks | Trans % |
|--------------|-----------|-----------------------------|------------|----------|-----------|--|------------|
| 382 | July 6 | Fair 92 | 92 | 632-409 | 16 | Fair Plates | 93 |
| 383A | 7 | Fair | 90 | 354-410 | 16 | Work good | 89 |
| 354-385A | 7 | Varnish heavy | 95 | 632-411 | 16 | Plates fair | 87 |
| " 384 | 7 | Plates look good * 80 | 80 | 362-412 | 17 | " " Var too thick nearly all plates patched | 85 |
| 632-386 | 7 | Fair plates | 92 | 354-413 | 17 | Var too thin plates sweet, many breakways broken | 85 |
| " 387 | 8 | Fair | 94 | 632-415 | 17 | Fair plates Var Too Thick | 86 |
| 354-389 | 8 | Fair " | 92 | 632-416 | 18 | " " | 84 |
| 632-390 | 8 | Fair " | 85 | 354-417 | 18 | Plates Fair | 86 |
| 632-391 | 9 | Fair " | 90 | 632-418 | 20 | Var Too Thick | 90 |
| 354-393 | 9 | Fair " | 90 | 354-419 | 20 | Var too thick | 88 |
| 632-394 | 9 | Fair " | 95 | 632-420 | 20 | Var too Thin | 88 |
| 632-395 | 10 | Varnish heavy - fair plates | 95 | 632-421 | 21 | " Very poor had steam on all day | 85 |
| 632-396 | 10 | Fair plates | 89 | 354-422 | 21 | Good plates, flooded by night men | 83 |
| 632-397 | 10 | Fair " | 90 | 632-423 | 21 | Poor plates, breakways - | 86 |
| 632-398 | 11 | Fair " | 94 | 632-424 | 22 | Var dont work up little better than yesterday | 87 |
| 632-399 | 11 | Good " | 87 | 354-425 | 22 | Flooded good, dry good - | 81 |
| 632-400 | 13 | Var Thick plates fair | 87 | 632-426 | 22 | Very thin plates poor, breakways - | 84 |
| 354-401 | 13 | Good plates. | 89 | 632-427 | 23 | Var Creaps, plates fair - | 86 |
| 632-402 | 13 | Varnish heavy fair plates | 87 | 354-428 | 23 | OK plates fair - 11 work | 87 |
| 632-403 | 14 | Fair plates | 90 | 632-429 | 23 | Thin - breakways - 45% look muddy many broken | 85 |
| 554-404 | 14 | Varnish Thin | 86 | 354-430A | 24 | Plates good | 87 |
| 632-405 | 14 | Fair plates | 88 | 632-431 | 24 | Very good | 90 |
| 632-406 | 15 | Good " | 90 | 632-432 | 24 | Good | 87 |
| 354-407 | 15 | Fair " | 90 | | | | |
| 632-408 | 15 | Fair " | 92 | | | | |

| Year | Date flowered | | F | 65 | lot # | Date flowered | | | |
|----------|---------------|----------------------------------|------------|----|----------|---------------|--|---------------|--|
| 854-433 | 25 | four plates | VP | 67 | 878 458B | 3 | Var very fine all plates good, | 84 | |
| 632 434 | 25 | Var very fine plates very | VP | 67 | 854 468 | 4 | plates good | 82 | |
| 854 435 | 27 | Var good | G | 79 | 879 469 | 4 | Var coarse plates good | 343 | |
| 632 436B | 27 | " | G | 79 | 880 470 | 4 | These plates the best we ever | had 87 | |
| 632 437B | 27 | " Very good | G | 78 | 632 471B | 4 | plates good | 83 | |
| 854-438A | 28 | Plates good | | 82 | 632 472B | 4 | " | 86 | |
| 632-439B | 28 | good | | 91 | 854-473A | 5 | " | 81 | |
| 632-440B | 28 | Var very good | | 93 | 892 474B | 5 | Works very good | Viscos 231-76 | |
| 854 441A | 29 | Var good | | 78 | 632 475B | 5 | Var poor, breakways, & muddy | 86 | |
| 632 442B | 29 | plates fair | | 92 | 854-476A | 6 | plates good | 83 | |
| 632 443B | 29 | plates good | | 93 | 899 477B | 6 | Works very bad breakways - | 76 | |
| 854-444A | 30 | Var too thin plates good | | 84 | 899 478B | 6 | plates bad, breakways & breakways - | 76 | |
| 867 445B | 30 | plates very good | Viscos 230 | 89 | 899 479A | 7 | Plates Rotten - Viscos 3-37 | 87 | |
| 632-446B | 30 | plates good | | 94 | 899 480B | 7 | plates very bad had stream on | 84 | |
| 854 448A | 31 | " | | 87 | 899 481B | 7 | plates bad had breakways & streaks | 87 | |
| 872 447A | 31 | flowered freely plates look good | | 87 | 899 482A | 8 | Var fair - | 87 | |
| 632 449B | 31 | Var good | | 87 | 899 483B | 8 | Var heavy flowered plates perfect | 87 | |
| 873 450B | 31 | plates look fair | Vis 6:21 | X | 899 484A | 10 | 3% breakways no dimples under microscope | 96 | |
| 632 452B | 31 | plates good | | 92 | 899 485B | 10 | Var high plates not good breakers | 96 | |
| Aug | 1 | | | | 899 486B | 10 | flowered bad streaks dimples, breakways | 93 | |
| 854-453A | 1 | plates good | | 89 | 899 487A | 11 | Var high but flowered more even no dimples | 97 | |
| 632 454B | 1 | plates very good | | 89 | 899 488B | 11 | no streaks or breakways | 88 | |
| 854-455A | 3 | Var good | | 90 | 903-489B | 11 | plates good | 74 | |
| 867 456B | 3 | plates very good | Viscos 1.4 | 75 | | | " | 88 | |
| 632 457B | 3 | plates good | | 85 | | | Works fine - plates good | 94 | |

Van #

date (month)

| | | | | |
|------|-------|----|----------------------|----|
| 903- | 490 A | 12 | good | 95 |
| 903 | 491 B | 12 | plates good | 81 |
| 903 | 492 B | 12 | " | 88 |
| 903 | 493 A | 13 | plates fine | 90 |
| 903 | 494 B | 13 | Van fair | 92 |
| 903 | 495 B | 13 | plates good | 86 |
| 903 | 496 A | 14 | Van good | 93 |
| 903 | 497 B | 14 | " | 94 |
| 903 | 498 B | 14 | plates good | 89 |
| 903 | 499 A | 15 | " | 85 |
| 903 | 500 A | 17 | " | 92 |
| 903 | 501 B | 17 | plates poor | 94 |
| 903 | 502 B | 17 | " | 96 |
| 903 | 503 A | 17 | plates good | 93 |
| 903 | 504 B | 18 | " | 93 |
| 903 | 505 B | 19 | " | 94 |
| 903 | 506 A | 19 | " | 93 |
| 903 | 507 A | 20 | " | 93 |
| 903 | 508 A | 21 | plates fair | 94 |
| 903 | 509 A | 21 | " | 94 |
| 903 | 510 A | 22 | plates good | 90 |
| 903 | 511 A | 24 | Van fair | 89 |
| 903 | 512 B | 24 | Van good, 9 gull Vin | 88 |
| 903 | 513 B | 24 | " | 88 |

| | | | | |
|------|-------|------------------|--|----|
| 903- | 514 A | 25 th | Van fair - plates scrap | 84 |
| " | 515 B | 25 | " | 84 |
| " | 516 A | 25 | Van good | 88 |
| " | 517 B | 25 | Van (thin) plates | 82 |
| " | 518 A | 26 | Van very good | 82 |
| " | 519 B | 27 | Van good | 83 |
| " | 520 A | 28 | " | 83 |
| " | 521 B | 28 | Van fair | 83 |
| " | 522 A | 31 | good | 83 |
| Sept | | | | |
| 903. | 523 A | 1 | Van good | 80 |
| " | 524 B | 1 | " | 77 |
| " | 525 A | 2 | Van found when 1 used 3 hours after OK - | 82 |
| 903- | 526 A | 3 | Van fair | 81 |
| " | 527 A | 4 | plates good | 78 |
| 903 | 528 A | 8 | Van very good | 84 |
| " | 530 A | 8 | Van good | 73 |
| " | 529 B | 9 | " | 49 |
| " | 531 B | 9 | good | 58 |
| " | 532 A | 10 | good | 67 |
| " | 533 B | 11 | " | 53 |
| " | 534 A | 11 | " | 73 |
| " | 535 A | 14 | " | 47 |
| " | 536 A | 15 | " | 67 |

Month

| | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 84 | 84 | 88 | 82 | 82 | 83 | 83 | 83 | 80 | 77 | 82 | 81 | 78 | 84 | 73 | 67 | 67 | 73 | 47 | 67 | 67 | 73 | 60 | 69 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|

| | | | | |
|------|-------|----|--|----------|
| 972 | 537 B | 15 | Var looks fine, plates look good | Var 3.33 |
| 973 | 538 B | 15 | " | Var 4.43 |
| 903 | 539 A | 16 | Works good | |
| " | 540 A | 17 | Var good | |
| " | 541 B | 17 | " | |
| " | 542 | 18 | " | |
| " | 543 B | 21 | " | |
| 981 | 544 B | 21 | Var looks good - not many breakways | |
| 983 | 545 B | 21 | Var don't look good - great many dimples + let patching to do | |
| 903- | 546 A | 22 | Var looks bad, lots dimples, lots patching - breakways thin edge | |
| 983 | 547 B | 22 | Var looks good, plates look fine Viscos at 10 4.45 Room temp 96" | |
| 903- | 548 | 22 | Var good plates good | |
| 903 | 549 | 23 | Var good plates fair | |
| 984 | 550 B | 23 | Var looks fine, plates look good Viscos 3.23 Room 92 - Var 82 | |
| 982 | 551 A | 24 | Better recall from this lot Var than from lot 545 B - not as many dimples or breakways - only few thin edges the good Vis 3.57 | |
| 903 | 552 A | 25 | Var fair few dimples thin edges or patching | |

| Humidity 8am 8pm | | |
|---------------------|-----|-------|
| 63 | VG | 67 72 |
| 35 | VG | |
| 74 | G | 46 47 |
| 82 | | |
| 80 | | 60 48 |
| 83 | | 64 31 |
| 83 | | 77 36 |
| 16 | S G | |
| 86 | | |
| 87 | | 51 60 |
| 70 | | |
| 65 | G | |
| 79 | F | 76 70 |
| 61 | VG | |
| | | 78 64 |

Notes

Stopped spraying powder

Moore thinks around 8th
Sept find out —

Up to Aug 6th used
2 1/2% Para in plates
varnish —

Used 1 1/2% Para from 6th
till 11th used 1 1/2%
from Aug 11th to date
1/2 1/2% used

Sept 1 left off all filter started
single bags only — used
single bag till Aug 10
2 bags on 11th since used 3 bags

Notes —

If phenol alcohol Penicillin residues ~~and~~
used in alcohol alone was Reg
Resin added it ~~is~~ devalores
as the free phenol of the
resin helps to make it sol-
I mean that which precipitates out on adding ~~the~~
Also little Resin of alcohol
to alcohol and its sol

It is probably the Resin which
decolor in Penicillin Resin
Coats + precipitates alcohol
decoloring some — If Resin
used in phenol + alcohol —
is treated that Resin (larger)
part decolors + which precipitates
by alcohol The alcohol is
very red + clear it now decolors
more while the Resin holds
the Tar + floats to top

Might be good way get rid
of Resin Tar —

987 $\frac{1}{2}$ Para 8% 6/4.
 NO Penta
 Alchohol 150% Resin has 165
 free phenol added 5.5 more
 10 gals -

This is Reg without Penta

549

987 Van Sept 29/14
 770 plates over #7 Tapvils not
 cut out. 7 hours
 Van Plate inspection

| | | | |
|---------|----|------------|-------------|
| Bubbles | 8 | } Discards | Commercial |
| Unseen | 13 | | Bubbles 653 |
| Nut | 8 | | Unseen 81 |
| Raised | 1 | | |
| Cracked | 0 | | |
| Dimpled | 1 | | |
| Chipped | 0 | | |
| | 31 | | |

Van flowers freshly - Color green
 Crisp at 1st day then dangles
 with edges - plates rock hard

Transfers Van lot 555-blank 742-907
 Total Transfers 368
 Total OK 153
 " Discards 213

Pullouts 91
 Van Cracked 107
 Mechanical 15

42%

NO penta $\frac{1}{2}$ para in this Van

988 - is $\frac{1}{2}$ para 8% 6/4 -
 5% Alpha Naphtol.
 150 alcohol. Resin has
 16.5 lbs phenol added 5.5%
 fresh phenol. NO para
 10 gals made in 60 min
 was there para -

As Naphtol Condensate there is no
 para in this - It must be the
 para settling out that causes
 pull out,

988 Lot # 556 B Green 7
 Top coils not cut out 7 hours 000
 Van discount Commercial
 Bubbles 5 Bubbles 576
 Unseen 1 Unseen 103
 Dust $\frac{5}{11}$

842-907 Blanks
 Transfer 340
 Total OK 11
 Discarded 329

Color Van grey green (loose)
 freely - plates don't look good
 Crisp too much, thin center,
 about usual amount of patching up

Pull out 310
 Van Cracked 8
 Mechanism 11

989 is $\frac{1}{2}\%$ Para 8% 6/4
 5% Trichlorophenol.
 No pentä 150 alachol
 165 Trichlorophenol in Resin
 added 5.5 more phenol
 10 gals made in open mixer

Trichlorophenol like alpha
 Naphthal Condenses a little

989 Lat # 557 B No 8 even 7 hours
 756 plates

Plate inspectn
 Bubbles 11
 Unseen 16
 Dirt 7
 Rained $\frac{17}{56}$

Compl
 Bubbles 345
 Unseen 360

This Var is similar to 987 but
 lighter in color - plates look good

Transfers -
 Transferred 353
 OK 205
 Discards 148

58%

Pull out 101
 Crooked Var 20
 Mechanical 27

990 Reg Van Except melted all
the phenol that is to be added
in the 6/4 Then added right
amount of alcohol. Then filled
in pores, then para 1/2 + 6/4
Reg then add Resin -

990 - lot 55813 Van looks like #903
acts like it only better
This Van is fine,

640 Plates 8 over 7 hours
Top coat not cut out.

Plate inspection

Bubbles 12

Unseen 2

Dirt 2

Raised 344

363 Discard

Comel -

Bubbles 277 -

Transfer - 139 Transferred OK 86 -
Discards 53

Pull Gels 10 -

OK'd Van 41 -

Mechanical 2

62 1/2

Notebook Series -- Notebooks by Edison
Notebook, N-14-09-30

This notebook was used during the period September-October 1914. It is the third of a four-book series, preceded by N-14-08-07 and continued by N-14-10-04. All of the entries are by Edison, except for some small notations by Sherwood T. (Sam) Moore. The entries pertain primarily to the transfer and printing process involved in disc record manufacture and to the Condensite varnish surfaces applied to record blanks during the process. Included are notes describing transfer and printing results obtained with various experimental varnish compounds, which contained different amounts of phenol, alcohol, "para," "penta," and "6/4." Additional entries relate to experiments by Jonas W. Aylsworth to hasten condensation. Inserted into the book are several loose pages of notes by Edison that tabulate some of the results noted in this book. The notes indicate that Archie D. Hoffman also assisted Edison. The front cover is labeled "Disc = 3." The pages are unnumbered. Approximately 125 pages have been used.

Sept 30 1914

Using raw pent + washing
it boiling with 2% HCl sol
~~got out but after~~
then precipitated with excess
HCl - got out large amount
The water solution was
then boiled down to dryness
& HCl driven off - after
thoroughly drying
absolutely dehydrated
considerable quantity
of sharp flocks the HCl-
flocks crystallized in
needles -

Adding Equal $\frac{1}{2}$ to Rec
Var of acetone, then add
alcohol. The Rec var
is demonstrated most by
acetone and by Benzol -

For July + Aug. our 1/2 of good
Intransfers (Kew High) last
plates flowed Sept 4 -
(Then 3 halidamp below 5000)

The plates below and the
gave 92% good but those
flowed on 8th & up to
late Sept are very bad
65 @ 75 1/2 mostly pphd well.

Another change we made
in Haldrops was to change
filling in Varnish in
blank powder from spraying
to pouring it in -

Examining the pull acct.
in Intransfers I find very
few cracks & believe
pull acct. start at fine
hair cracks - if so
then the trouble as to
pull acct. is due to blank
not to Varnish, but

thought this was impossible
till I discovered these fine
cracks at every pull & cut —
Think veneer dont cold as
Yuccash is unequally distributed
in powder by pouring it in

Try 2 lots reg Var 903
two bottles dishes — one had
Some alcohol saturated
with ammonium put in &
the other equal amount
Alcohol no ammonium
They did not act much
different,

Tried 2 with Reg Resin
in alcohol saturated
with ammonium work
as good as Reg & less
Bubbles ^{no pain or trouble}
_{much come off shaper}

Sept 30/14

996 Reg 903 Var - except $7.8\frac{1}{2}$ of 6/4
"instead of 8/6 - Resin 16.5
Lot 566 B Room Temp 90 Fels Var Temp 80°
Yucca 328. Varnish works good plates look
fine, Varnish thickens after flowed on plates
P

Transfer - Reg Schedule -

Made 302 - - - - -
OK 212 - - - - -

Cracks 34
Pull outy 54
Bird 54
Mechanism 2

70²/₁₀

Req Var to check 997

Pull out ~~||||~~ not fried edges ~~||||~~
OK ~~||||~~ not fried ~~||||~~ R

4 OK Transfers -
9 pull outs -

8/6/4

30.7%

Rept 30/14

997 Req 903 Var except 8.2% 6/4
instead of 8.1% Res 16.54 ~~res~~ phenol
Lot 58713 Room Temp 93° Var Temp 82°
Vucos 3.47 Varnish flowed freely
Var crisp but center coat too thin -
plates look good

Req Schedule
316 made
131 OK
185 Discarded

Cracked 21
Pull out 164
(Burdine)

41%

Sept 30/14

998 Reg 903 Var Except 8.4% 6/4

Wetland of 8% Room 16.5% plume

Lat 56813 Room Temp 95° Var Temp 86°

Vuco 3:19 Varnish creeps not much
patching up - Plates look good

Transfer 324 made

OK 180

Dis 144

Pull out 36

Cracked 107

Metalwork 1

55¢/s

Sept 30/14

999 - Reg 903 Van except 8.6% 6/4
instead of 8.1% Resin 16.5%
Lot 56913 Room Temp 98° Van Temp 84°
Vacos 3.21 Van didn't cross much
plates look fair, lots thin edges.

Resin -

| | |
|-------------|-----|
| Transferred | 274 |
| OK | 157 |
| Dis | 117 |

| | |
|------------|----|
| Pullouts | 14 |
| Cracked | 47 |
| Mechanical | 26 |

| | | | |
|-----|-----|----|----|
| 274 | 157 | 0 | 57 |
| 13 | 8 | 18 | |
| 29 | | | |

Sept 30/14

1000 Pug 903. Van Except 8-8.1/2 6/4
Resen 16 1/2 Resen -
Lot 570 Room Temp 96° Van Temp 84°
Yucca 3.15 Van floored nicely, Crispa,
Thin edges + few dummies, plates fair

Transp - 1323

OK 214
Dus 109

66

Lifted 1
Pull out 23
Cracks Van 83

Sept 30/14
 At same time we put in same avens
 903 Reg Lot 565 as a check
 to the 2pts with 4/4 def % -

Sept 30/14
 1001 Reg Var 903. Except 9% 6/4
 Room 16.5% Observed
 Lot 57113 Room Temp 90° Var Temp 84°
 Viscos 3.15 Var if Coated Greasy,
 thicker on some parts of plates. Crisps
 unevenly - plates fair -

Transfer 312 made
 OK 170

Net 142

54.50
 Pullouts 14
 Cracked 128

Transfer
 Made 72
 OK 142

Pullouts 2

Crack 28
 20

This does full cuts but
 hardens it so cracks
 increase -

1002 Reg 903- fullered old
way (was a single bag
in Can - Resin 16.5 ft per plumb

~~Transf~~

~~Mate 96 Pull out 42
OK 50 OK Van 4
Dis 46 76
52%~~

Transf 358
OK 232
Dis 126-

Pull out 105-
CRD Van 21

64%

With Reg Van. we transferred holding
at Reg 15 min 100 lbs steam 500 lbs
also another Cat held 20 min -

Reg 15 min 24 plates 16 OK-
6 pull out 2 CRD Van

20 min 24 plates 15 OK
8 perfect,
1 mechanical

100 gms phenol. 5 gms $\frac{6}{4}$
long glass tubes in both of flask
upright on hot plate
Does not show any
signs of condensation or thickening
after 60 hours -

100 phenol 10 gms $\frac{6}{4}$ after
60 hours thickens some +
gives a Resin -

100 phenol 15 gms $\frac{6}{4}$
60 hours is about right
Condensation. Very thick
Molasses like + pours all
out OK

It could require 16 to 16 $\frac{1}{2}$
to produce same result in
10 hours I think -

100 gms phenol + 20 gms
 $\frac{6}{4}$ gives a very solid in
2 $\frac{1}{2}$ hours - probably for Varnish
18 to 20 gms $\frac{6}{4}$ about 5-6 used

Note, If formaldehyde be added to a cooling solution of Paraphenylenediamine it gives a very fine bulky precipitate. This if dry does not show the slightest sign of melting or softening if put right on the hot plate.

Also this precipitate is insoluble in boiling alcohol.

This reaction may account for Para's action in Venen -

It is not sol in acetone or Benzol - S.S.

If Paraphenylenediamine is dissolved in alcohol formaldehyde does not precipitate anything. But when 100 mmol of water add the precipitate appears.

This would show that if there really is 22 gms of free phenol in Parva added we should use up 5.3 grams alone for phenol leaving only 2.7 gms to harden the mass -

Note, This combination is sol in hot phenol S.S.

But pouring on dish a very slight sediment separates probably impurities in Para - after free phenol smoke stops coming from dish I notice sediment redissolves so its OK if it does the business.

Here is a Cur. - Took pure phenol
put in still 6/4 could get in hot
by shaking - poured out on
butter dish right on hot plate

Poured in 2 dishes, in one
put in a little para - none
in the other -

Both started smoke being
phenol distilling off -

Soon the dish with para
stopped distilling off
phenol, & turned color & going
into a brownish

While the other, the phenol
all distilled away &
left nothing but
matted white crystals
of 6/4 in other words

Para in brownish prevents
great loss of phenol in
oven & hardware plates

When put on hot plate crystals
reduplicate.

Very Good.

This is a very striking & important
Experiment

After $\frac{1}{2}$ hour the phenol $\frac{6}{4}$ para
is thick resin on hot plate butler
dish but don't seem to want to harden
enough, to get more $\frac{6}{4}$ in it will
be necessary I think to use
instead of pure phenol
phenol with some alcohol in
to get enough $\frac{6}{4}$ in

I will try $\frac{1}{2}$ phenol & $\frac{1}{2}$
alcohol

When $\frac{1}{2} + \frac{1}{2}$ is tried the
wax of alcohol becomes
out $\frac{6}{4}$ in crystal form
& its ng — no para —

Tried Phenol only slight alcohol
This also throws out $\frac{6}{4}$ when para
put in ~~even~~ even worse

think got too much $6/4$ —
No I am mistaken it is phenol
that crystallized out getting cool
by Evap of Alcohol on pulling
right on hot plate goes clear

Both with & without para
when put right on hot plate
phenol distills off.

Another bug with phenol &
but little phenol —
Para precepitate out,

Also same thing when
Formal HCl crystals form
forming Formalddehyde into
alcoholic Para, used
in place of $6/4$ —
precepitates out even
worse than when
 $6/4$ only used

There is no doubt but with 2 liter $6/4$
or Formal HCl - addition of para preserves
75% of the phenol from Evaporation
in little better dish right on
hot plate,

$6/4$ seems more favorable as it
don't precepitate much para
out,

$6/4$ alone nearly all the phenol 95%
Evaporates & escapes condensation
which a pinch of para in the
Duplicate print saves 75% &
it recovers —

I note that the formal HCl without
para $1/2$ recovers & don't distill
& recovers some coherent plain
 $6/4$ phenol all goes,

I rather think formal HCl is good
without para, perhaps w/out
more a bit & but it may not be
as good as $6/4$ with para —
am weighing out to make definite
expts —

Dutch Chem

Oct 1/14

by his own method of determining
free phenol in Resin gals

| | | | |
|-------------|------|------|------|
| #625 | 626 | 627 | 628 |
| 81.4% Resin | 83.4 | 83.5 | 81.8 |

With distilling in alkali + precipitating
gal

| | | | |
|------|------|------|------|
| 82.1 | 84.2 | 84.7 | 81.6 |
|------|------|------|------|

No 1

25 phenol
5 gms 6/4
250 mlq Para-
20 gms alcohol.

This Resin is broken in
bulk then 2 or 3 -
4 is softer - 2 hardest
approximate bulk No 2
2nd + No 1 3rd -

I had to use alcohol
to get clear solutions

No 2

25 gms Phenol
5 " 6/4

1/2 " para.

20 alcohol drenches hot,
+ not easily -

Unlike No 1 more para caused
the phenol to go solid more
quick than 250 mg in
bottle before I was ready
to pour on dish -

This one gives a hard
Resin + the largest in
bulk - This is almost
as hard as Reg Hoff
Resin -

994- 80.3 Resin 19.7 prep phenol in 7.

2.3 phenol added Lot 563 B

8 1/2 6/4 1/2 para 6 1/2 Phenol
based on actual amount of Resin
145 DMat Al - 3 quarts made

Flowed 9/29/4 pm room Temp 88°
Vat 88° Viscosity at 70 5.01
Used roller - patch every plate, dangle
breakaway, then 2 layers

Oven - 1 Bubble 20 - Dunes
30 Counsel - Bubble

Transfer 15 made 7 OK 8 Dis

3 pull outs
5 CKD Van

46 1/2

995- 84.6 Resin 15.4 free phenol
6.6 free phenol added -

8% 6/4 1/2 para 6% Para -
Based on natural content of
Resin 150 Alcohol 3 gtl Var

Flowing - 9/29/14 room temp
88° Var 82° Vicos 5.15 -
Worked like 994 - no better -

Oven 34 Bubblers Discard
Couch 11 - Bubblers -

6 Transf -
4 SR -
2 Dis -

1 pull out 66%
1 mechanical

991 - 510 (at
Reg Var 903)

Used room containing 15.4 free phenol
added 5% phenol 10 gals made
open reactor

Open - Reactor 5 -
Vinson 3 - } 24 D - seconds
Rained 15 -

39% Council Kabbles -

Transfer - 282 made
216 OK
66 Discards

Pull out 2

Cracked Var 62

Mechanical 2

76%

Sept 9/29/14 - f closed

993- 562 Lat 903-

Race 19.7 prephenal added

5% prephenal 1

Hoffman - Viscos 5.19 Jump 78
Fluorogen 6.02

| | | |
|---------------|----|----------|
| Oven - Bubble | 9 | } 83 Dis |
| Unseen | 14 | |
| Dirt | 6 | |
| Recess | 54 | |

every 7-7 hrs

537 Concl

Transfer Box 269 - Transferred
215 OK
54 Dis

Pull cuts 25-

Cracked Van 27

Mechanical 2

79 3/4

No 4

25 phenol

5 6/4

20 alcohol no para

All 1 2 3 4 + 5 in dish
on asbestos at 4:45 pm
in 5 minutes the phenol
in 4 + 5 with para
had crystallized out with
6/4 - whereas No 1 2 +
3 with para were
clear in 5 minutes
after all the Nos 1 to
5 had gone crystal-
line from Evap of
alcohol

No 3

25 phenol

3 3/4 gms 6/4

20 alcohol

1/2 7 Para -

I now put dishes from asbestos
right on the metal of hot plate

No 3 is only one that for least
10 minutes is all liquidified

Phenol is dissolving off of all
it looks like it being due to
low 6/4 & high para

At 5:12 or 27 minutes after
pulling on 1 2 + 3 are
clear while 4 is nearly
dry & crystallized + 5 all
phenol probably dissolved
off -

5

25 phenol

3 3/4 6/4

20 alcohol no para

Nos 4 + 5 are hopeless
must have para to
hold phenol from
boiling out in oven

I now take 4 flasks
containing nos 1 to 5
& add 5 grams of
water to each
nos 1 + 2 were solid

when cold no 3 liquid no 4
solid & no 5 liquid

When the 5 grams of water
were put in all the
solid ones ^{except 4} became
almost instantly liquid
& clear phenomena 5

no 4 only lagged, some cry
not quite dissolved -

Took all off - 4 + 5 nq

1 2 + 3 solid & clear look
good - No wonder we
need para -

at 530 pm Oct 1/14
pour 1 to 5 with 5 grams added

Water to the mix - better
plates on $\frac{1}{16}$ thick cardboard
on hot plate -

All but No 3 went crystalline
at 545 put right on hot
metal -

Not so much smoke of
phenol off the water lat.

~~W~~ Water 2pt 1 2 4 3
Clear & resins -

4 crystalline & phenol
apparently dissolved

off - 5 $\frac{1}{2}$ Cry $\frac{1}{2}$ liquid

took off - acts about same
as fresh water, not quite
as good, and amount of
Resin is less say 20%

No 2 being greatest

amount. This shows that
water is not dangerous
apparently -
Remembers Water was put in
after I had poured one set
plates & therefore must be
equal to 7 grams or 35 gram
of water to 100 alcohol.

I now add to the balance of the
mixtures in 1 to 5 after having
poured out 2 rounds - or about $\frac{1}{2}$
I add one gram of Penta which
I also add out of E1 penta
by Alcohol which was
original Ross Penta unwarmed
or treated by Hoffman -

The phenomenon about
this Experiment is that I can't
see any smoke from any
it appears as if Penta
held phenol. but possibly
alcohol has now gone & most
have gone crystalline & not
clear & water will now

start to go off & will get
Smoke & phenol well
go -

It may be in a case if
there is much water in
Alcohol + Resin -
that the water will
hold back ~~some~~ phenol
from Evap. & so keep
as long as it will
above 212 until it's gone
at that time phenol
will be more syrupy &
non volatile.

It clears on all but #4
after 10' water gone & smoke
is very small compared
to the others, 1 & 2nd
Round,

It certainly looks as
if Penta helped Para
to hold phenol in Varnish

till it got non volatile.

Took 1 2 & 3 off. Much resin not
fired - Thicker than either
Round 1 or 2 - & Best yet
yield slightly better than any -

Even No 4 without para is
a resin but more than $\frac{1}{2}$
probably $\frac{2}{3}$ has distilled
off - (smokeless & bubbleless)
No 5 is smoking but
unlike the others 2 standards
is clear - Took No 5 off
no resin - just "pyralid" & alk
left - etc -

3rd Round (Penta) - 1 & 2
hard #3 soft - Very black

Apparently anything that
will hold phenol from distilling
out of Varnish till it gets to the

Non Volatile state is good -

Para-phenylenediamine is par.
excellence the best substance
its action is wonderful

Next comes penta. which is
only moderate as compared
to para,

It may also be otherwise
beneficial -

Moore Expt No 1 on
Transfers -

Reg Var 903 - Lot 565 B

Transfer Schedule
5 min at 500 lbs instead
of the sec of 15 min at 500 -

12 Transfers -

Pullouts III IIII

00%

Honorable pull out -

Moore #3

Reg -

Reg Schedule -
15 min at 500 lbs -

Pull out III

OK III III

Evidently our
press schedule is
OK & fast,
this is not cause
pull out

Moore #2

Reg like Moore 1

10 min at 500 lbs -

Pull out III III

OK III

Kallen had
better than No 1 Moore -

Moore #4

Oct 1/14

600 plates washed & set
aside for 24 hours
& 600 plates washed &
used right off - Rec 903
Var. Lat 559

used right away

Hed 24 hr

| | |
|--------------|------------|
| Transmit 287 | Transf 288 |
| OK 168 | OK 178 |
| Dis 119 | Dis 110 |

| | |
|----------------|----------------|
| Pullouts 100 | Pullouts 100 |
| Cracked Van 11 | Cracked Van 10 |
| Medians 8 | <u>110</u> |
| 119 | |

Transferred both day & night

It cost the plates
Evidently the real cause
pull out -

Continuation of E Experiment
with Condensing phenol -
New flasks recalc up
Numbered 6 7 8 9 10 -

No 10 Edison

10 I think

25 grams Phenol.

5 " 6/4

250 milg Para

1 1/2 grams Pentar got from Raw Pentar
by alcohol after combining E No 1 -

No 6 Edison

25 grams phenol

3 3/4 " 6/4

1 1/2 " Penta -

As there is considerable
Resin 75@80% left it
shows penta acts weakly
as substitute for Para -

Edison No 7

25 grams phenol

5 " 6/4

1 1/2 " Penta -

Couldnt get this to dissolve
all in the phenol although
very hot it would
Crystallize out, all
the others dissolved
to clear

It wont stand so much
6/4 #6 just stands it
& is the limit

Whereas with 1/2 para
Everything is fine -

Edison No. 8

25 grams Phenol

3 3/4 " 6/4

1 1/2 " Pentol

1/2 " Para

No. 9 Edison

25 grams Phenol -

5 " 6/4

1 1/2 " Pentol

1/2 " Para

9-7-10-6-8

Notes, ~~set~~ 6 7 & 9 + 10
on asbestos 11 pin -

I didn't measure off the
amount but on choa
plate,

9 10 + 8 right on hot plate
don't crop or smoke & are
perfectly clean at 11 12 -

7 is cropping some & crystals
in it 6 is cropping
slightly & smoking a bit.

Remember I put no
alcohol in the
experiment I had in
1 to 6 -

at 1120 pin -

9 10 + 8 are serious
thick - 8 is the thickest
7 still crystals - 6 clear -
no smoke.

as I had difficulty to mix
7 + 6. 7 being impossible
+ 9 10 + 8 mixed ok -

Evidently Pentac Para
Cameos 6/4 To desalve
good & in their absence
6/4 Crystals set.

This is another important
fact of crystallization,

as I had more trouble
with 1st lot with Para
to get all the 6/4 to
desalve although Para
present than I had
with this lot. Evidently
Pentac helps to desalve 6/4

Oct 1/14

Took them all off at 1135 pm

I noticed when I was heating this bunch with Corks in two of them blew corks out although there was no alcohol - There must be some reaction making vapor or gas - possibly alcohol in the paint but it was small -

I note that No 6 with no para is the hardest resin while 9 10 + 8 are much softer, that must be due to fact that the 6/4 didn't distill off like it did in No 6. which having much less phenol got a bigger dose of 6/4 & got harder

No 7 is not a resin but a mass of encrusts probably 6/4
(where as 8 & 9 had as much 6/4 as 7 gives big gelled resin

Same as 6, 7 & 9 + 10 -
but to remaining material added 10 grams alcohol to each - all clear

8 9 10 7 6 in rows
8 is 1st to left - on 12 mid night on alcohol -

When alcohol is used it creeps badly up to edge of dish - not as when no alcohol except some crisp where no para used

At 1207 or 7 min after pouring in dish on alcohol 8 & 9 are resin as well as 10 8 & 9 about same 10 not so much

#6 no rain - a drop on cold
glass shows phenol crystals
& #7 is still all crystals
phenol & 6/4 cry

at 1225 am take off -
8 has no bubbles
9 some
10 the most
7 all cry
6 clear no bubbles

There is doubt about which is
10 as I have 2 #8's

7 all cry & smoking even
after take it off

at 2 pm 8 9 & 10 are
liquid in the flasks
(10) The remaners not used
while 6 & 7 are crystals & solids

Unkies Hoffman Review itself
is hard enough to stain the
Reproduction all that it needs
is to fire it just a little to stop
brittleness -

Thank we want to keep our
6/4 low & use 2% para
+ ^{4 @ 6} of good Penta of
even quality -

Passably 7.5 @ 7.6 6/4
with 2 para will do,
Even less we have 2
Expts. running there
with less than. 7.8 1/2 6/4 -
as 7.8 quoz 70% good transfer
with only 1/2% Para think
7.4 will do if use 1%
Para

11-12-13 Remarks -
Only #11 was clear

12 & 13 had lots undissolved
Crystals. 12 the worst
big sediment.

Evidently Para is incompatible
with X - precipitates

after putting on metal
of hot plate. No 11 has thrown
down Crystals -

Notwithstanding Crystals
etc all have formed resins
at 1.35. rather thin -
& apparently all the Crystals
are disappearing - evolution
getting clear,

See next page

On at 1.15 am

E 11

25 phenol
3 $\frac{3}{4}$ gms of X crystals made by
adding HCl to $\frac{6}{4}$ in alcohol
10 gms alcohol
yield of resin 6.100 gms

E 12

25 gms phenol
3 $\frac{3}{4}$ X — see #11
 $\frac{1}{2}$ gm Para -
10 " Alcohol
yield 6.550

E 13-

25 gm Phenol
3 $\frac{3}{4}$ gm of X see #11
yield 7.100 $\frac{1}{2}$ gm Para
1 $\frac{1}{2}$ " Penta E1.
10 gm alcohol

11-12-13- Continued,
Considerable smoke coming
off 140.

Evidently X is not worth
much for our purpose
not as good as 6/4.

Naturally as phenol deslits
off resin will get thicker.

All clear - Will let them
stay all night & go
home -



#11 is hardest 12 is softer
& 13 little softer than 12
but close & have apparently
12 has operational talk

1003-574 lat.

Reg Van Except Room 20.9

5 1/2 lbs phenol - 1

10 gal -

Transfer 288

OK 139

Discard 149

Lat 57413 Room 1
92° Van 82° Vis 3,47
Wks OK after wet sand/acc
Van strokes, matted
plates good -

Pull out 103

Cracked 46.

48%

Open - Bubbles 9

Unven 7

Dirt 18

Courel

non-port

1006-lat 577-

Reg Van
of st-

7.6% 6/4 malon

96 made

20 OK

Pull out 66

CKD 5

Mech! 2

Room 16.5 fiss.

phenol 5.5

1/2 pan

7.6% 62

20% Pessis -

12% at -

21% —

Open Bubbles 8

Unven 5

Dirt 1

Round 6

20

Full security report

Transfer 315

OK 166

Dirt 149

Good Bubbles 438

Unven 192

52%

Pull out 118

Cracked Van 29

Mechanical 2

Remarks to date Oct 2/14

1 Its not the Ovens

- 2 " Presses or schedule
3 " More or less pre-phenol
4 " More or less 6/4 in relation
to free phenol -
5 " Not Varying temp of mixing
or flow rate -

6 = Think should make 10 gals &
only Extract Penta by Alcohol
using no phenol -

Oct 2/14

JWA Has tried a lot of chemicals to
hasten Condensation in
Under these conditions

| 1/2 | to (min) | the hours it took | Percent |
|-----|----------------------------|-------------------|-----------------------------|
| | | Hour | Percent |
| 3 | Plain Varnish | 93 | |
| 3 | Paraphenylenediamine | 12 | |
| 2 | Oxidized " | 25 | |
| 4 | " " | 15 | |
| 4 | Aniline Hydrochloride | 25 | |
| 2 | " " | 36 | |
| 2 | Paraphenylenediamine | 20 | |
| 4 | Phosphorocamphid (Hattley) | 18 | Very small amount dissolved |
| 4 | Benzidine (Base) | 15 | Only 1/2 dissolved |
| 4 | Ortho Toluidine | 22 | |
| 4 | Methylene-Phenylenediamine | 20 | Only little dissolved |
| 4 | Para Amido ortho Cross | 19 | |
| 4 | Para Amido | 26 | |
| 4 | Toluidine (Base) | 37 | |
| 2 | Aniline Oil | 29 | |
| 2 | Succinic Acid | 37 | |
| 2 | Aniline Oxalate | 29 | |
| 2 | Xylidine | 30 | |
| 4 | β-Naphthalamine | 39 | |
| 4 | Parachloroaniline | 38 | |

10/2/14

1007 Spent Vacuum
10 gal - 2% Para 7.8% 6/4

Resin -

| | | |
|----------------|------|-------------------|
| Open Bubbles 4 | } 49 | Coral Bubbles 547 |
| Unseen 8 | | |
| Dirt 2 | | |
| Reused 30 | | |
| Dumplings 1 | | |

Flowed 1 1/4 - 14 - Run - Room Temp 90
Van 94 - Vis 5.20 Van f. Colors
freshly good body plates
look good

OVEN - 590 plates 575/13 hot Van
Top coils cut out

Bubbles 4
Unseen 8
Dirt 2
Reused 20
Dumplings 1

pull out at outlet
2.4% very small -
Coral very small -
margin C. shells

Coral 540 -

Transfer. 205 Transfer
150 OK
55 Descend

7/3 1/2

Pullouts 20
Cracked Van 32
Defects 3

Vanish Req Different % of 6/4

% 6/4 % ok Turn Pullouts Cracks

| | | | |
|-----|----|-----|-----|
| 7.6 | 21 | 66 | 8 |
| 7.8 | 70 | 54 | 34 |
| 8 | 73 | | |
| 8.2 | 41 | 164 | 21 |
| 8.4 | 55 | 36 | 107 |
| 8.6 | 59 | 77 | 14 |
| 8.8 | 50 | 0 | 5 |
| 9.0 | 54 | 14 | 128 |

Req

12 months

Note

| | | | | | | | |
|------|-------|------|----------------|------|----|----|----|
| 991# | Revin | 15.4 | 5 extra Phenol | 20.4 | 76 | 62 | 2 |
| 993 | " | 19.7 | " | 24.7 | 79 | 27 | 25 |
| 1003 | " | 20.9 | " | 25.9 | 29 | 12 | 46 |

| Total hrs phenol | % ok Turn | Cracks Pullouts |
|---------------------|-----------|--------------------|
|---------------------|-----------|--------------------|

Note as phenol goes up
Cracks diminish & pull outs increase

Hoffman well dup all 3 using 2% para
instead of 1/2

• 991 + 993 Req 903 Van - 1/2 % para

only 90 - 1000 200 mm

1010^B Check on Sprayed Blankets
1010

100 Transfers made

75 OK

25 Dis -

Pull Cuts 15

OK View 7

1010 - Blank Expt. Varnish 1% Para
~~Sprayed~~ process of mixing

100 Transfers made

78 OK

22 Dis

18 Pull cuts

4 Crows

1008

Free phenol up to 25% instead of 22%
seg amount
Lot 58015 Ruomt 1 1/2 Para -
Vio 4.32 Wks OK Little Vain streaks
Thickness after coloring - plates look good
Oven - Puller 2 } 135 - 512 OK
 inner 122
 Rust 8
 Rend 8

Transfer 216 made
160 OK
56 Discard

Pull out 39
Cracked 17

74

Hoxack Corvethin

does not perceive anything
Para or 6/4 out of
alcohol so it can
be used —

1005 — Lot 576 B

~~Reg~~ Reg Var except 7.7 6/4
instead of 8%

Resin — 165 free

Given Soft Var 16
Butler 5
Unseen 1
Dirt 2

Raised 2 } 31
Dumplings 1 }

620 planks
bills 13.77
unseen 192

flowering room 96° Var 82° Vis 3.45
Var (lightens on plates after 1 hour)
Mottle, Var (lightens) plates look good

Transfer made 273

OK 85-
Dis 188

Pulls 162
Grades 26-

31.0%

Transfer plates Baked over 7 hours
total 144 hours —

Transfer made 22

OK 10
Dis 12

Pulls 12

45.0%

| | | |
|-----------|------|------------------------|
| 18 | 31.5 | S 4-7-14 F 4-15-14 |
| 19 | 36.3 | S 4-17-14 F 4-25-14 |
| 20 | 35.9 | S 4-25-14 F 5-5-14 |
| 21 | 16.2 | S 5-5-14 F 5-16-14 |
| 22 - Spec | 4.8 | S 7-5-7-14 |
| 23 | 17.3 | S 5-16-14 F 5-25-14 |
| 24 | 17.7 | S 5-25-14 F 6-4-14 |
| 25 | 19.8 | S 6-5-14 F 6-13-14 |
| 26 | 24.2 | S 6-13-14 F 6-22-14 |
| 27 | 17.6 | S 6-22-14 F 7-1-14 |
| 28 | 20.8 | S 7-1-14 F 7-9-14 |
| 29 | 18.2 | S 7-9-14 F 7-26-14 |

Penta Salt Solubility in Alcohol

| | | |
|-----|----------------------|---------------------------------|
| 7 = | Insoluble | Start 1/17/14 finish 1/29/14 |
| 8 | 21.3 | 26.5 |
| 9 | 26.8 | Start 1/29/14 finish 2/11/14 |
| 10 | 21.6 | S 2/11/14 F 2/21/14 |
| 11 | 18.9 | S 2/21/14 F 3/4/14 |
| 12 | 23.9 | S 3/4/14 F 3/15/14 |
| 13 | 22.9 | S 3/15/14 F 3/19/14 |
| 14 | 22.6 | S 3/19/14 F 3/16 " |
| 15 | 17.8 | S 3/16 " |
| 16 | Spec - still soluble | S 3/26 14 |
| 17 | | S 3/30/14 F 4/7/14 |

| | | |
|-----|-------|------------------------|
| 30 | 24.6 | S 7-16-14 F 7-22-14 |
| 31 | 18.9 | S 7-23-14 F 7-29-14 |
| 32 | 17.8 | S 7-30-14 F 8-5-14 |
| 33- | 17.9 | S 8-5-14 F 8-8-14 |
| 34- | 29.4 | S 8-8-14 F 8-12-14 |
| 35- | 22- | S 8-12-14 F 8-17-14 |
| 36- | 24.3 | S 8-17-14 F 8-24-14 |
| 37 | 20.4 | S 8-25-14 F 9-3-14 |
| 38- | 21.9 | S 9-3-14 F 9-22-14 |
| 39- | 21.3- | S 9-23-14 F 9-26-14 |

Spent 9/27-28

40 - 21.1 S 9-28-14
F 10-3-14

41 - 22.9 S 8-3-

Our Denatured al
is 100 grain 5 wood
alcohol -

190 proof or shadeless
than 95%

Hoffman says ^{the most common} most 6/4
you can get in our alcohol
is 22% we use 8%.

Sample Reg Run Oct 1/14 (unpacked)

903 Van Lot 559 - 942-907
1346-7-8 open 5 hours

Total Transf'd 5281
OK 3740
Discomb 1541

Lift, crunched 1
Pullouts 1292
Cracked Van 153-
Mechanical 93

70% 70.7 vandy

1008 - Resin up to 25% instead
of 22. 1% Resin 16.5 per phenol

7 hours -

Transferred 312

OK 211

Dus 101

67%

Pull Cuts 62

Cracked 39 -

dot 579 A Room T 92° Van 87
Vis 3.25 Van wks good - plates good

1011 - Resin 16.5 ~~2%~~ 2% Para
7.9 $\frac{5}{4}$ - 4% of Saponified Pent
that Sol in alcohol 3% Insol
7 hours -

dot 583 B Room 89 Van 78 Vis 345
Van streaky, Olive mottled,
Creeps - plates look good

Transf'd 306

OK 200

Dus 106

65%

Lifted 2

" Exp 2

Pull Cuts 66

Cracked Van 36 -

1012 - Resin 16.5 - free phenol
 1% Para 7.8 $\frac{1}{2}$ Mixed alcohol
 + Pentas together & filler in
 press. Then added phenol -
 6 para + resin - Resin Vol 1.56
 4 16.5 para 14.5 Vol 4.03 Resin 100
 from resin 94 Vol 5.01
 This is spent to prevent phenol
 from developing out too
 stuff 6 from Papula 7 However

Lot 586 B Room T 94 - Var 84
 Vis 5.5 - Motta Veni cracks
 plates look good

Transf 297
 OK 237
 Dis 61

Pull out 45
 Cracked 15

oven
 Bubbles 3
 Unw 6
 Out 1
 Resin 6
 Dimple 20
 18
 Count
 Bubbles 159
 Resin 478

79.8%

Duplicate 1012 B
 Resin Vis 2.11 16.6 Resin Al 142 Var Vol 4.55
 Room T 95 - Floor 10/7/64 Room 55 Vis 5.00

Transf 304
 OK 162
 Dis 142

Pull out 101 53%
 Ck 41

Plate - Motta - Veni cracks, breakage, then 24 plates (not good)

1013 - Duplicate of 991 Var
 Except 2% Para instead of 1/2%
 Resin 15.2 free phenol

Lot 584 B Room T 94 - Var 80
 Vis 4.45 - Thicker all out on
 plates looks good -

Transf 373
 OK 248
 Dis 75

Pull out 46
 Cracked 29

76%

1018 - Spd - Lot 591 7 hours
 Resin 16.6% phenol 1% para
 7.8 6/4 - 10 gal - 8% Phenol
 #41 Penta -
 Room T 92° Var 84° Vis 445
 Matte, Vm streaks Creeps, thickens on
 plate plates look good.

Transfer - 100-
 OK 75
 Dis - 25

Pull water 10
 Cracked 15

75%

Oven Bubbles 3
 Unseen 2
 Rained 30
 Dimples 1 } 36 Dis Bubbles 337
 Unseen 224

1019 Lot 592 -

Resin 16.6% phenol 1% para
 7.8 6/4 - 2% Phenol 10 gal

Oven - Bubbles 10
 Unseen 8
 Dnt 4
 Rained 2
 Dimples 2 } 29 - Comal
 Bubbles 244
 Unseen 365

Transfer - 100-
 OK 72
 Dis 28

Pull water 15 72%
 Cracked 10

1020 lot 593 - 4 hours

16.6% free phenol in Resin -

2% Para - 8% 8/4 -

No Penta - 16 - 7 ac

| | | | | |
|------|-----------|---|----------|------------|
| OPEN | Bubbles | 2 | } 15 Dis | Cornel |
| | Unseen | 9 | | Bubbles 4 |
| | Dirt | 2 | | Unseen 497 |
| | Dumplings | 2 | | OK 200 |

Free phenol 100
OK 45
Dis 53

45%

Free phenol 46
Cracked 9

982 - 1st one HCL Ept 1/8 14% 903 Var
Transfer 274
OK 236
Dis 38

86% -

(38) Penta

Pull out #1
L.H.C. 4
Chd Var 33

982 B HCL New Penta - New resin
Transfer 5095
OK 2953
Dis 2092

(39) Penta

L.H.C. 11
P.H.C. 1830
Chd 209
Unch 49

58%

C
982 ~~88~~ only difference is different
Resin + New lot Penta - #41 lot penta

HCL Ept

Room 89° Var 84° Vis 4:40 molts
Van checks. Req amount of peeling
No edges not many dimples or breakings
Plates look good

Transfer - 318
OK 292
Dis 26

Free phenol

HCL 1/4 compound only little bit of alcohol quite set water

91%

No pull out
Cracked 26

Open - Bubbles 1

Unseen 3

Dirt 2

Raised 6

Dumplings 2

Cornel

Bubbles 462

Unseen 200

Cornel - 240 had fine bubbles
396 unseen

981 B+ / No 41 Paula

726g Spat. Only difference between
this & old one is different resin
& new Lat Paula #41 Lat Paula

Resin T 90 Var 84 Vco 4:10

Mottle, Van streaks, not much pakebin
plates (a date given)

| | |
|--------------|-----|
| Oven Bubbles | 4 |
| Unven | 6 |
| Dirt | 6 |
| Raised | 6 |
| } 22 | |
| Pinches | 292 |
| Unven | 366 |

Transfers - 303

OK 272

Dis 31

89.7%

Pull out, 4
Cracked Van 27

Oven Bubbles 3
Unven 4
Dirt 2
Raised 19

Couch 333 had fine bubbles
272 Unven

All 10 gal lots made
in Open Meyer

1st 981 - 726g 1/4% 903

Transfer 300
OK 49
Dis 251

left old 20
pullout 231 16 1/2%

1016 - Lat 587 7 hour down

Reg 903 - with Double Coashed
old Paula that Hoffman has had for
long time - Resin 1616 10 gal

Transfer 282

OK 243

Dis 39

86%

Pull out 9
Cracked 30

Oven Bubbles 25

Unven 10

Dirt 3

Raised 7
45

Couch - 563 had fine bubbles
no unven

101% Resin 166 ppc phenol 1% Para
7.8 6/4 8% Phenol -
10 gal Lat 591.

Penta N^o 41

| | | | |
|--------|-----------|------|------------|
| - Oven | Bubbles 3 | } 36 | Comol |
| | Unions 2 | | Bubbles 33 |
| | Raised 30 | | Unions 224 |
| | Dimple 1 | | |

Transfers 280

OK 203

Dis 77

Pull Cuts 31

Lift Cks 1

Cracked Van 45

72^{1/2}

Regulars. with 41 Penta

Transfers 285

OK 224

Dis 61

78%

Pull Cuts 26

Cracked 33

Mechanical 2

1019 - Lot No 592 No 41 Penton -

Reson 16.6 precip - 1% Para 7.8% 6/4 -

2% Penton

oven Rubbles 10
Unven 4 } 29
Dust 4
Reson 4
Dimples 2

Transferrd - 306

OK 220

Dis 86

Pull out 59

Chd Van 27

Commol
Rubbles 244
Unven 368

41%

1024 - Lot 598 - 29 Edison

Phenyhydrazin - 3% Para 7.9 6/4
Kept Cold 10 gal -

oven Rubbles 7
Unven 14 } 57 Dis
Dust 10
Reson 1
Dimples 19

Transferrd 333

OK 140

Dis 193

Rubbles 19
Unven 448
OK 200

Pull out 89

Chd Van 104

42%

1025 Lat 599 - 30 Edison
 250 wdg glass int plates acid
 16.6/Frame - 2 para 7.9 6/4
 4% Penton 1% wdg -
 10 gcl

Over - Bubbles 1
 Unseen 4
 Out 2 } 21 Dis -
 Raised 2
 Dimple 1K

Bubbles 27
 Unseen 40
 OK 200

Transfers 316
 OK 175
 Dis 141

Pull out, 76-
 (K) 65-
 55%

1022 27 Edison Var Gun Damaged.
~~16.6~~
 16.6 Rem frup - 2% Para 7.9 6/4
 3% gun mixed Gun Damaged
 with alcohol & afterwards
 add balsam cluff -
 18 gcl water in open No Penton.

Over Unseen 5
 Out 1
 Raised 2 8 in

Bubbles 13
 Unseen 469
 OK 200

Transfers 340
 OK 288
 Dis 58

Pull Out 9
 Cracked 43.

84%

1021- E 27. Alpha Naphthal

Resin 16.6 2% Para 7.9 6/4
2% Alpha Naphthal

10 gals in open
oven unstop
Poured 2 } 1000s
Dimpled 1 }
Came 627 Kurvan

Transf. 314
OK 187
Dis 127
59%

Pull out 93
OK Van 34

Reg Van made in open
(903v)

Transf. - 348
OK 285
Dis 63

81%

Pull out 54
OK Van 7
Mechanical 2

1020 - 16.6 Free P in Resin - 2% Para
8% 5/4 - NO penta -

10 gal in open market
OK 200
Bubbles 2 } 15
Kurvan 9 }
Dent 2 }
Dimpled 2 }
716 plates
Came
Kurvan 497
Bubbles 4
OK 200

Transf. 350
OK 208
Dis 142

59%

Pull out 82
OK Van 60

1032 - 16.6 Resin 7.9 6/4
1/4% Phenylhydrazine -

Transf. 100
OK 17
Dis 83
17%

OK left 10
Pull out 7
Cresol 66

1021- E 27. Alpha Naphthal

Resin 16.6 2% Para 7.9 6/4

2% Alpha Naphthal

10 gals in Open
oven unoven } 100s
Rinsed 1 }
Dumple 1 }
Conrad 627 unoven

Transf 314

OK 187

Dis 127

59%

Pull out 93

Chd Var 34

Reg Var made in open
(903v)

Transf - 348

OK 285

Dis 63

81%

Pull out 54

Chd Var 7

Crushed 2

1020 - 16.6 Free P in Resin - 2% Para
8% 6/4 - NO para -

10 gal in Open unoven } 716 para
OBena Bubbles 2 }
unoven 9 }
Dust 2 } 15- unoven 497
Dumple 2 } Bubbles 4
OK 200

Transf 350

OK 208

Dis 142

59%

Pull out 82

Chd Var 60

1032 - 16.6 Resin 7.9 6/4

1/4 Phenyldiisocyanate -

Transf 100

OK 17

Dis 83

17%

Chd diff. 10

Pull out 7

Crushed 66

1029 Reg Resin 16.6 Reg
Excerpt 4% Penta #41

GOEN - Bubble 7 } Comal
Unseen 6 }
Dirt 6 } 23 Dis Bucer 577
Resin 5 }
Dimple 2 }

Transfer 288
OK 189
Dis 99

Pulls 47
OK/Var 52

65%

1030 Resin 16.6 7.9 $\frac{6}{4}$ -
 $\frac{1}{2}$ % Glacial phosph acid -
no penta - dissolve $\frac{1}{4}$ in al -
(then add glacial - don't exceed up)

GOEN - Bubble 10 } Comal
Dirt 3 } 20 Dis Bucer 698
Dimple 7 }

Transfer 349
OK 350
Dis 299

Pulls 48
Buds 4
Cracked 194

Lefts Cracked 18
" Cracked Edge 35

14%

1023- 28 Edison
16.6 Room 2 1/4 Para 7.9 $\frac{5}{4}$ 2 1/4 Penta

41 Penta,

52%

Transfer 296

OK 176

Dis 120

Over Bulbs 5 Penta 2
Unworn 10 Dimple 1

Pull Out 32

Cracked 58

Cornel

Bulbs 63

Unworn 327

OK 206

1026 31 Edison - 16.6 Room 2 Para
7.9 $\frac{5}{4}$ 4 Penta 3 1/4 Water.

41 Penta

Transfer - 308

OK 173

Dis 135

56%

Pull Out 54

CKD 81

Cornel

Bulbs 22

Unworn 412

OK 200

Over - Bulbs 4

Unworn 4

Dis 3

Penta 5

Dimple 7

Chipped 1

24 Dis

1027 32 Edison 16.6 Room 2 Para
7.9 $\frac{5}{4}$ 4 Penta (41) 3 1/4 ammonia -
Open wiring

Cornel

Over

Bulbs 3

Unworn 13

Dis 10

Penta 7

Dimple 9

Bulbs 24

Unworn 579

Transfer 302

OK 217

Pulls 65

CKD 20

71%

~~1081~~

1031 16lb Resin 7.9 6/4 077
glacial phos acid - Dissolve 6/4
in Alcohol first then make prep
with small amount of Al - then add
Wnt to 6/4 No Pentin -

Open - Bubbles 2
Unison 28
Rent 3
Raced 106

539 Cornal

Transfd 188
OK 28
Dis 166

Lifts Ckd 18
Lifts Ckng 16
Pills Ckd 26
Cnd Van 106

Record

Phos Combines with 6/4

Loweston

Regular today Transfd Oct 6th -
903 Van ~~40~~ 40 pencils

Transfd 2698 Made by 46mm
OK 2374
Dis 524

Lifts Ckd 4
Pills Ckd 474
Ckd Van 43
Mechanical 3

85% OK

Reg Made Oct 11 = (40) pencils
Open mixer -

Transf 302 10 gal
OK 173
Dis 129 57% —
Pills 116
Ckd 4

Oct 8

1034 - Lot 613 - 16.6 Resin 7.9 5/4
1% Chloride Ammonia
No para or Penta 7 hour - 613B

Flaming room Temp 88° Var 80. Vicos 2.45
Color Lemon, plates have good body
Matte - Plates look good

OVEN

| | |
|------------|------------|
| Bubbles 10 | Uneven 647 |
| Uneven 4 | Palish 51 |
| Dirt 2 | |
| Raised 13 | |
| Smudge 6 | |

| | |
|--------------|---------------|
| Transf'd 316 | Pullouts 38 |
| OK 256 | Cracks Var 21 |
| Dio 60 | |

81%

Prints 12 inspected
4 Discarded - 3 chd in music 1 - fed him
8 ok

725

| | | |
|------------|------------|---------------|
| Prints 244 | Knocks 14 | (Drocks) 6 |
| Dio 67 | Sootish 1 | fell back 22 |
| OK 177 | Palish 7 | poor print 6 |
| | Old Chd 1 | white spots 5 |
| | Roughing 5 | |

Oct 8 1914

1035 Lot 614 16.6 Resin 7.9 5/4
3/4% Chloride Ammonia - Lot 614B

Flaming Room T 90 Var 84 Vicos 2.50
Matte, lemon color good body plates
look good.

Plate Bubbles 7

| | |
|--------------------------|-----------|
| OVEN - 720 Plate 7 hours | Uneven 44 |
| | Dirt 15 |
| Uneven 629 | Smudge 3 |
| Palish 39 | Chipped 1 |
| | 24 over |
| | 46 |

Transf'd 336

Pullouts 67

OK 247

Cracked 22

Dio 89

Print 12 heated
6 Discarded

Prints 66%

73%

1 Knock
3 Holes
1 fall back 1 cracked

50%

Reg Oct 9th

Prints 235

Knocks 1075

Transf'd 120

OK 150

OK 93

Dio 27

Cracks 3

Palish 2

Roughs 2

Chipped 4

Cracked 23

Poor print 17

Pullouts 17

Chd Var 10

1036 - Lot 615 16.6 Resin. 7.9 $\frac{5}{4}$ -
 $\frac{1}{2}\%$ Chloride of ammonium -

Flowing Room Temp 90 Var 86 Viscos 2.42
Lemon color, plates look good -

| | | |
|------|------------------------|-------------|
| Oven | Dio - | Concl |
| | Bubbles 1 | Bubbles 48 |
| | Uneven 13 | Uneven 514 |
| | Dirt 7 | Patches 135 |
| | Raised 1 | |
| | Dimples $\frac{5}{29}$ | |

Transferred - 349
OK 284
Dio 65

Cooked Gels 9
Left OK 1
Pust. 41
Cracked 14

81%

1037 16.6 - 7.9 $\frac{5}{4}$
 $\frac{1}{2}\%$ Para 3% Gum Dandarac - dissolved
Dandarac in Alcohol first -

Flowing room Room T 98 Var 81 Visc 3.24
Color green, mottled, Vam streaks
not much patching. Plates look good

Print 272 1036
Dio 570 Knox 12
OK 200 Gratch 3
Run 6
Lohit Spot 13
Spot
Holes 11
Cracked 8
Feeding Cracks 28

73.5

1040 - 16.6 Recm 7.9 6/4 - $\frac{1}{2}$ Hydrochloric
 + 90% Alcohol -
 det 620 New 6/4
 Oven - Bubbles 5- } 62 Dec
 Uncom 15-
 Dist 9
 Dimpler 33
 Counsel
 Bubbles 498
 Unvera 208

Transfer 349
 OK 188
 Dis 161

Pulls 90
 Cks Var 71

545%

1038 16.6 Recm 7.9 4/4 - $\frac{1}{2}$ HCl.
 Req 95% at - #2 det of 6/4 new
 Lot 618 1 Para, 716 place
 Oven - Bubbles 6 } Bubbles 359
 Dist 2 }
 10 dist 2 }
 Transfer 2 }
 Dimpler 7 }
 716 place
 Bubbles 340

Transfer 322
 OK 255
 dis 67

Pulls 40
 Cks 27

79%

1039 Resin 16.6 Deep of 1038

Except ~~1038~~ para

Lot 619 New 6/4 #2 9/4

Oven - Bubbles 2 } 19 Dis Bubbles 521
Unknown 4 } Unknown 200
Dirt 3
Dumple 2

Transfer 860

OK 242

Dis 11.5

67%

Pulls 75

Ckd 43

1041 - 16.6 Resin fractional 7.9 6/4
1 3/4 Chloride ammonia

95% alcohol

Lot 621 - cl. No 2 6/4

Oven - Bubbles 2 Cracked 2
Unknown 15
Dirt 5
Ravel 4
Dumple 9

Coupled

Transfer 300

OK 200

Unknown 323

OK 217

pulled 77

Dis 83

72%

Pulls 56

Ckd 27

1037- 16.6 Pasin- 1/4 Para 7.9 6/4
3/4-Scandianac in alcohol first.

Flowing rom Temp 98° Var 81 Vis 3.24
Color green Mottle, Vane shrink.
Not much preheating Plate Cook 90.00

Oven
Bubbles 0
Unven 4
Dirt 3 min 635 OK
Raid 29
Dimple 19 35

Transfer 317
OK 314
Dis 3

Pullouts 00
Cks 1

Mechanical 2

DONT STAND WEAR TEST

91.4%
Note No Bubbles

99.53%

Prints 314 tested.

Knocks 23
Cracks 5
Holes 2
Runouts 8
Scratches 1

Rough surface 4
Cracks at Edge 1
Cracked 6
Feed line Crack 21
Poor prints 5
White spots 4

Total
80
Print 23%

No 2 6/4 Hereafter will last 2 weeks

1049 Dup of 1037 except 1/2% Para

Transfer 294-
OK 281-
Dis 13

95%

5 sheets to plate
Cracked Van 10
Lifts 3

Oven Finishes 7
Dirt 1
Raid 115-
Cover
Bubbles 590

#2 4/4
1050 - Dup of 1037

Oven -

Bubbles 4

Dirt 3

Raised 52

Disruptor 1

Coupled

Bubbles 570

93%

Transfer 277

OK 258

Dis 19

Cracked 19

4 trials 20 free release 907 blower bag + air intake
flowed 10/12/14 Lot 632 B. Oven 7-

1051 - 4 Sandrae, 7.9 6/4 #2
1 para -

Oven

Bubbles 6

Dirt 3

Raised 60
69

Coupled

Bubbles 621

Transfer - 294

OK 285

Dis 9

96%

Chd Var 9-

THIS WEARS WORSE THAN 2%
of 1052.

1052 2% Sandarach 7.9 #2 6/4
1 para

Oven Bubbles 15 Cornal
Dirt 4
Packed 5 Bubbles 464
Dumplings 3

Transfered 239
OK 216
Dis 13

Cracked Van 11
Pullout 1
Mechanical 1

Only shows
Wester compound
Slight 1%
Sang think
4%
15
79 4%

would show much finer

Oct 13-14

Reg run

Transfered 100
OK 78
Dis 22

79 1/2

Pullouts 22 -

1043 - Lat 624 1616 Room 7.7 6/4
1% Chloride Aluminum -
Reg alcohol

Oven Bubbles 4 720 peak
Unven 8 Cornal
Dirt 4 Bubbles 12
Dumplings 29 Unven 471
Patches 192

Transfered 330
OK 251
Dis 79

76%

Pullouts 62
Cracks 17

1044 - Lot 625 8% 6/4 -
1% Chloride Ammonia -
Reg alcohol

Ovens Bubbles 1 Conch
Uncon 15 Uncon 473
Dirt 7 Packed 199
Rained 1
Dimple 19

Transfer 100

OK 72
Dis 25

72%

Pull Out 17
Cracked 11

1047 Lot 628 Resin 16.1 7.9 5/4
1% Chloride Ammonia -

Transfer 300
OK 235
Dis 65

74%

Pull Out 37
Cracked 31

1042. Lot 622 Recv 16.6 .7.9 6/4

2.55% Chloride ammonia -

90% Alcohol - 616 plates

| | | |
|---------------|------|------------|
| Over Bubble 2 | } 12 | Unseen 378 |
| Unseen 3 | | plate 226 |
| Dirt 3 | | |
| Remed 2 | | |
| Dumple 2 | | |

1061.

10 Gal - 8 6/4
2 1/2% Dragons Blood, alcohol filtered
1% Para Green Bubble 5 } 695 plates
Dirt 4 }
Remed 3 } 15
Dumple 3 }
Conch Bubble 640

Transfer 339
OK 203
Dio 136

59%
Pull out 55
OKD 81
Mechanical -

50% streak to plates -

1062- 10 gal

8 6/4

3% Elemi
1% Para

fuller Alcohol
670 plates

Oven Bubbles 13
Unseen 12
Dirt 2
Dumplings 4

Plates unseen 443
Used at night 200

Transfer 322

OK 236

Dis 86

Pull out 15

Cracks 66

73%

50% stick to plates

Very few bubbles on plates

Some none

Transfers Very fine - almost fine

Color darker on big transfers

Printed 60

OK 53

Dis 5

Chd 3-fish line

Pow P 2

91%

1063- 10 gal

8 6/4

1.9% Opibanium

Oven Bubbles 14

Unseen 40

Dirt 3

Raised 2

Cracked 3

Dumplings 14

fuller Alcohol
684 plates

Bubbles - unseen 408

76 Transfers up to 200

Transfer 304

OK 191

Dis 113

62%

Pull out 13

Cracked 99

Mechanical 1

7 Hour even lot 64113

1055 16.1 Regen - 1 para 8.8 6/4
3 1/2 Sandwina 147 al

Open Bubbles 4 }
Dust 1 } 225 Dis - Bubbles 525-
Raised 219 }
Sample 1 }
old Sandwina

Transfer 250 Coated 2
OK 248 99.2%

Surface test show that it is as good as regular Moore think it shade lower than regular
Dont Cut after 50 runs on music of 2 records tested both (more)
fluent run out - 5. (more)

1 of 2 Reg records tested
1 had Run out - 70%

more
112 OK
13 OK
13 OK
13 OK
13 OK
13 OK
13 OK
13 OK
13 OK
13 OK

Prints - 133
OK 119
Dis 14

Manuscript 1
4th line OK 13
14

1 Wear test 100 OK no wear
2 Repairs 50 line show degradation

89.4

1054 16.1 Regen 1 1/2 Para
8 1/2 6/4 -
3 1/2 Sandwina 147 al

Open Bubbles 22 }
Unseen 28 } Coated
Dust 11 } Dis 193 Bubbles 487
Raised 127 }
Sample 5 }
Transferred 237
OK 236
Dis 1

Coated Vase 1 -

99%

Surface test of prints shows no wear but surface cuts - of 2 records tested 1 had cut RD - Evidently 8 1/4 not enough when 3 1/2 inch disc used

Record Cuts & 6 1/4 is not Enough -

Prints 154 Coated 9
OK 157 Proof 6
Dis 151 Eps 2 imp
91% NG
Discarded clean

1053. 16.1 Resin 1/2 para
 7.9 6/4
 1% Chloride ammonia
 147 ac

Open Bubbles 5 }
 Unseen 5 }
 Dust 11 } 57 Dis
 Rained 36 }
 Corned Bubbles 641

1056 16.1 Resin 1 para
 8.1 6/4 - 3% Dandelion
 147 Alcohol

Open Bubbles 11 }
 Unseen 17 }
 Dust 3 }
 Rained 28 }
 Dimple 1 }
 Corned 451
 91 6/10k 200 -

Transfer 326
 OK 319
 Dis 7

97%

Cracked Van 7

Printed 60
 OK 45
 Dis 15

250 times wear multiple little ^{frad} cracks 15
 75% Eye Impact

Oct 16 - Regular

Transfer 100
 OK 93
 Dis 7

93%

Pull out 6
 OK 1

1057 16.1 Recm - 1% Para
8.2 6/4
0% Sandstone
147 Alkalal

Open Bubbles 12
Unseen 21
Rased 32
Dumple 3
Dust 6
Cone
d0% Bubbles 453
Unseen 200

Transfer 326
OK 323
Dis 3
TH
99%

Cracked Var 1

250 times, only shows little in ear a OK

Printed 60
OK 55
Dis 5
91%

Cracked 5-fall line - Eye Impulse

1058 16.1 - 1% Para
8.4 6/4 -
3% Sandstone -
147 Alkalal

Transfd - 294
OK 293
Dis 1
99

Mechanical defect 1

Prints 221
OK 216
Dis 5
Feed Lincks 3
Poor Prints 5
Eye impulse

97.5%

1059 - 161 Recm 1 para
8 6/4 -

1% Scandumac -
147 d (2) school

| | | |
|-------------------|------|---|
| Oven - Bubbles 18 | } 16 | Coul - Bubbles 276 Unown 168 OK 200 644 97.6% 16 96% |
| Unown 18 | | |
| Dist 9 | | |
| Reused 2 | | |
| Dumple 16 | | |

Transfd 321
OK 309
Dis 12

96%

Cracked Van 12

Printed 242 }
OK 234 - } Eggs inspection
Repaired 8 }
4 feedline cracks
4 poor parents
96%

1060 161 Recm 1/2% Perme
8 6/4 -

1% Scandumac -
147 d (2) school

| | | |
|-----------------|------|--|
| Oven Bubbles 14 | } 16 | Coul - Bubbles 406 Unown 200 606 74 680 |
| Unown 22 | | |
| Dist 17 | | |
| Reused 17 | | |
| Dumple 7 | | |

Transfd 300
OK 283
Dis 17
94.1%

Cracked 17 -

245 turn only above moderate cocar

Printed 206 }
Repaired 16 } Eggs inspection
OK 200 }
97.2%

Oct 15 Reg
Transfd 100
OK 76
Dis 24

pull out 16
chk Van 8

76%

1064 Dup of 1055

Open - Bubbles 23
Unseen 12
Dirt 12
Rinsed 14
Dumplings 6

739 plates

Bubbles + Unseen 356
Unseen 113
69

538

Note for 1055 was with old
standards in lab 30 years
219 raised in oven

Transfer 334

OK 334

100%

Prints - 260

OK 254

Nis 6

Feed him cracks 5
Cracked 1

97.7

1065 Dup of 1055 but
use 1/2% Para

Transfers 276
OK 275

99%

Mechanical 1

Printed 213
OK 213

Eye Inspections only

100

1066 - Dup of 1055 1%
 paper with 1/8%
 Dragon bleed - 8.8 6/4

Oven - Bubbles 14
 Union 7
 Dirt 2
 Raws 100
 Dimple 4

127

Cornel
 Bubbles 343
 Union
 Transf 200

Transfer 241
 OK 262
 Dis 9

96% -

Crisped 4

Mechanical 5

Printed 188
 Rejected 4
 OK 184

Explosion

3 chd
 1 poor print

Int

97%
 97%

1067 Dup of 1052
 2% standard 8.6 6/4

1% Power -
 Oven - Bubbles 8
 Dirt 11
 Raws 10
 Dimple 8

Transfer 338
 OK 331

97%
 97%

Cooked Curry 3
 Cracked 2
 Mechanical 2

Print 60
 OK 52
 Dis 8
~~OK 52~~

70% hum ck 8
 86%

Oct 14/14
 #1058-645 Lot 16, 1 run
 1% Para 2.1 of 64
 3% Sandstone 662 plates

| | | |
|------|-------------|-------------|
| Oven | Bubbles 23 | Conc'd |
| | Unseen 16 | Bubbles 389 |
| | Dirt 13 | Unseen 200 |
| | Raised 14 | <u>589</u> |
| | Dumplings 7 | <u>73</u> |
| | <u>73</u> | <u>662</u> |
| | | 99% |

Transfers - 294
 OK 293
 Dis 1
 99%
 Cracked 1

1045 - Lot 626 Run 1616 7.8 6/4
 1% Chl ammonium 700 plates

| | |
|----------------|-------------------|
| Oven Bubbles 3 | Conc'd |
| Unseen 19 | Unseen 534 |
| Dirt 16 | plates <u>125</u> |
| Raised 6 | <u>659</u> |
| Dumplings 12 | |

Transfers 229
 OK 171
 Dis 52
 77%

Pullouts 40
 chd 12

1046- Resin 15.05 7.9 6/4
 1% Chloride Ammon

Oven Bubbles 9
 Then Edge 17 Uncon 492
 Uncon 14 Packed 128
 Dirt 5
 Packed 6
 Samples 53
 134

Cancel 724 plate

Transfer 210
 OK 147
 Dis 63 70% -

Pull out 50
 Cks 15

1048 Resin 17.4 7.9 6/4
 1% Chloride Ammon

Oven Then Edge 5-
 Bubbles 7
 Uncon 17 Uncon 625
 Dirt 3 Packed 37
 Packed 2
 Samples 37
 71

Transfered 331
 OK 177
 Dis 154! 55%

Pull out 122
 Cks 32

1068 2 1/2% of Clear resin Extracted
from Sandarak Ey Bengal
1% Para. 8.4 16/4

Oven - Residues 10
Unseen 19
Dirt 11
Rained 18
Dimples 17

Transferred 304
OK 299
Dirt 5

Cracked 1
Cooked Cuts 3
Nacht - 1

Prints 60
OK 60
Eyes inspection 100%

1069 White residue of Sandarak
not sol in Bengal. 2 1/2%
1% Para. 8.4 16/4 -

Oven - Residues 23
Dirt 10
Dimples 4
Rained 42

Transfer 100
OK 98
Dirt 2

Cracked 2

98%

Prints - 60
OK 49
Dirt 11

81%

1070 - 2% Sandarac 1%
Para 8.4 6/4
1/2% Nigrosine ^{WNS} to Color

1071 Var Resin 16.1 1% Para 8.2 6/4
1 Sandarac

10-

1072 Var same as 1071 with 1/8%
Nigrosine -

1074 Var 16.1 1% Para 8.4 6/4
1 1/2 Sand

1075 - Var same as 1074 with
 $\frac{1}{8}\%$ H. grass

1076 - Resin 15.7 $\frac{1}{8}\%$ Para 8.6, 6/4
 $\frac{1}{8}\%$ Para

1070 Var Resin 16.1 $\frac{1}{8}\%$ Para
8.4 $\frac{1}{8}\%$ 6/4 - 2% Sandrase
 $\frac{1}{2}\%$ H. grass

[ITEMS(S) FOUND IN BOOK]

| | | | |
|------|-----|------|--------------------------------------|
| 1060 | 50 | 2160 | No signs wear |
| Req | 50 | " | No signs wear |
| 1060 | 180 | " | Just notice white shade but OK |
| Req | 180 | " | note few hills has polish peeled etc |
| 1066 | 50 | 4027 | OK |
| Req | 50 | " | OK |
| 1066 | 100 | " | OK shade of cut on Castrol hills |
| Req | 100 | " | ditto. |

[ITEMS(S) FOUND IN BOOK]

| | | | |
|------|-----|-------|--|
| 1059 | 50 | 24949 | OK |
| Req | 50 | " | OK |
| 1059 | 100 | " | Petroleum for his front |
| Req | 100 | " | ditto |
| 1059 | 250 | " | Very little measure of wear - over 100 |
| 1058 | 50 | 38333 | Notice shade of white |
| Req | 50 | " | " " " |

[ITEMS(S) FOUND IN BOOK]

| | | Speaker | |
|------|-----|---------|--|
| 1065 | 50 | 14959 | Shows faint tendency scrape polish on a few teeth |
| Req | 50 | " | About same shade better |
| 1065 | 100 | " | Polish very little hurt but hills are cut rather bad as if piece of polish pulled off - not OK |
| Req | 100 | " | None to compare |
| 1065 | 50 | 38536 | No white OK |
| Req | 50 | " | No white OK |
| 1065 | 100 | " | Shows no white but slight distinction of polish on teeth |
| Req | | | None white |

[ITEMS(S) FOUND IN BOOK]

| | | | |
|------|-----|-------|--|
| 1064 | 50 | 38333 | Can't see any wear |
| Req | 50 | " | About same |
| 1064 | 100 | " | Wear noticeable Too Much, micro shows only surface polish gone, on uphill of big leaders - no hills torn |
| 1064 | 50 | 38353 | White shows too much |
| Req | 50 | " | " |
| 1064 | 100 | " | Very white & NG wears out Cut only polish wears off probably due to lack of polish |
| 1066 | 50 | 19399 | No signs wear |
| Req | 50 | " | No signs wear |
| 1066 | 100 | " | No signs wear |
| Req | 100 | " | No signs wear |

[ITEMS(S) FOUND IN BOOK]

| No | Para | Sandwich | 64 | Bubbia | Unseen | Dirt | Dimple | %K ¹⁰⁰ | Remedy | Bubbia | Unseen | OK | Cert ¹⁰ | Mechanical | % ¹⁰⁰ Frang | diff: | Stack | Pell ¹⁰⁰ | %OK ¹⁰⁰ |
|------|------|----------|----|--------|--------|------|--------|-------------------|--------|--------|--------|----|--------------------|------------|------------------------|-------|-------|---------------------|--------------------|
| 1068 | 1 | 2 | 84 | 10 | 19 | 11 | 17 | 99 | 15 | | | | 1 | | 100 | | | | 100 |
| 1069 | 1 | 2 | 84 | 23 | | 10 | 4 | 98 | 42 | | | | 2 | | 100 | | | | 81 |

[ITEMS(S) FOUND IN BOOK]

| | Para | Song | 6/4 | Bulls | Unseen | Dirt | Marine | Simple | 1/48 | Bubble | Unseen | OK | Front Cover | Mechan | Mechan | Front | Left | Stick | Right | Front | Left |
|-----|------|------|-----|-------|--------|------|--------|--------|------|--------|--------|-----|----------------|--------|--------|-------|------|-------|-------|-------|------|
| 037 | 1 | 3 | 7.9 | 0 | 4 | 3 | 29 | 19 | 995 | 635 | | 1 | 2 | 317 | | | | | | | |
| 048 | 1/2 | 3 | 7.9 | 7 | | 7 | 115 | | 95 | 590 | | | 10 | 294 | 3 | 5 | | | | | |
| 050 | 1 | 3 | 7.9 | 9 | | 3 | 82 | 1 | 93 | 570 | | | 19 | 277 | | 4 | | | | | |
| 051 | 1 | 4 | 7.9 | 6 | | 3 | 60 | | 96 | 621 | | | 9 | 294 | | | | | | | |
| 052 | 1 | 2 | 7.9 | 15 | | 4 | 5 | 2 | 94 | 464 | | | 11 | 1 | 239 | | | | | | |
| 053 | 1 | 3 | 8.8 | 4 | | 1 | 219 | 1 | 992 | 525 | | | 2 | 250 | | | | | | | |
| 054 | 1 | 3 | 8 | 22 | 28 | 11 | 127 | 5 | 99 | 487 | | | 1 | 250 | | | | | | | |
| 056 | 1 | 3 | 8.1 | 11 | 17 | 3 | 28 | 1 | 96 | 451 | 200 | 4 | | 326 | | | | | | | |
| 057 | 1 | 3 | 8.2 | 12 | 21 | 6 | 32 | 3 | 99 | 453 | 200 | 1 | | 321 | | | | | | | |
| 058 | 1 | 3 | 8.4 | 23 | 16 | 13 | 14 | 7 | | 389 | 200 | | | | | | | | | | |
| 059 | 1 | 1 | 8 | 18 | 18 | 9 | 2 | 16 | 96 | 276 | 168 | 200 | 12 | 321 | | | | | | | |
| 060 | 1/2 | 1 | 8 | 14 | 22 | 17 | 14 | 7 | 94 | 406 | 200 | 17 | | 300 | | | | | | | |
| 064 | 1 | 3 | 8.8 | 23 | 12 | 12 | 16 | 6 | 100 | 356 | 113 | | | 100 | | | | | | | |
| 065 | 1/2 | 3 | 8.8 | 11 | 13 | 6 | 75 | | 99 | 389 | 182 | | | | | | | | | | |
| 066 | 1 | 3 | 8.8 | 14 | 7 | 2 | 100 | 4 | 95 | 543 | | | 3 | 2 | 100 | | | | | | |
| 067 | 1 | 2 | 8.6 | 8 | | 11 | 10 | 8 | 97 | 688 | | | 2 | | 100 | | | | | | |

What 100
also cut
also cut

89.4
91.11
15

91.5
96
97
97.7
100

97
86

37 (0.0008)
37 (0.0008)
37 (0.0008)

Notebook Series -- Notebooks by Edison
Notebook, N-14-12-03

This undated notebook is a continuation of N-14-04-26. It was probably used during the period August-October 1914. All entries are by Edison, except for several notations by another experimenter, possibly Frederick P. Ott. The entries pertain to experiments aimed at the rejuvenation or "regeneration" of used storage batteries. Included are the results of tests performed on cells constructed with different regenerated components, primarily old negative electrode "pockets" reconstructed with treated iron or formed using different crimping dies. There are also a few experiments that involve regenerated positive electrode "tubes" made with treated nickel hydrate. Most of the experiments bear sequential numbers, 241E-382E. Some of the cells produced in these experiments were apparently transferred to the Edison Storage Battery Co. at Silver Lake for continued testing. Their subsequent performance is tabulated in N-14-12-14.1 (see Notebooks by Edison and Other Experimenters -- Storage Battery). Inserted into the book are two memoranda by Walter N. Archer and several loose pages of notes, probably by H. H. Smith. They date from the period August-December 1914 and relate to regenerated iron and nickel experiments being conducted for Edison. The front cover is labeled "Regeneration No Two." The pages are unnumbered. Approximately 160 pages have been used.

Older
241E (2370H)

K Arsenate

| | | |
|----|------|------|
| 1 | 1700 | 1390 |
| 2 | 1735 | 1410 |
| 3 | 1695 | 1400 |
| 4 | 1735 | 1440 |
| 5 | 1690 | 1420 |
| 7 | 1590 | 1380 |
| 9 | 1675 | 1475 |
| 11 | 1700 | 1460 |
| 32 | 1375 | 1180 |

242E (2380H)

K Bromate

| | | |
|----|------|------|
| 1 | 1600 | 1610 |
| 2 | 1660 | 1590 |
| 3 | 1620 | 1570 |
| 4 | 1660 | 1580 |
| 5 | 1625 | 1590 |
| 7 | 1535 | 1510 |
| 9 | 1615 | 1610 |
| 11 | 1645 | 1635 |
| 32 | 295 | 1285 |

700
100

old Fe

243k (2390#)

K Binoxalate

| | | |
|----|------|------|
| 1 | 1665 | 1610 |
| 2 | 1685 | 1645 |
| 3 | 1555 | 1545 |
| 4 | 1590 | 1580 |
| 5 | 1595 | 1575 |
| 7 | 1475 | 1465 |
| 9 | 1620 | 1635 |
| 11 | 1645 | 1625 |
| 64 | 1707 | 1690 |
| 65 | 1637 | 1625 |
| 66 | 1640 | 1637 |
| 32 | 1390 | 1375 |



244k (2400#) Very Red

244 K Hypophosphorous.

| | | |
|----|------|------|
| 1 | 1500 | 1615 |
| 2 | 1500 | 1650 |
| 3 | 1425 | 1575 |
| 4 | 1445 | 1625 |
| 5 | 1465 | 1575 |
| 7 | 1390 | 1505 |
| 9 | 1475 | 1610 |
| 11 | 1485 | 1600 |
| 65 | 980 | 977 |
| 66 | 977 | 977 |
| 32 | 1290 | 1440 |

old 72

245E (2410H) dark.

K Propionate -

| | | |
|----|------|------|
| 1 | 1645 | 1650 |
| 2 | 1645 | 1680 |
| 3 | 1555 | 1585 |
| 4 | 1590 | 1625 |
| 5 | 1590 | 1595 |
| 7 | 1460 | 1575 |
| 9 | 1540 | 1660 |
| 11 | 1560 | 1700 |
| 12 | 945 | 1060 |
| 13 | 960 | 1055 |
| 30 | 1350 | 1240 |

246E (2420H) dark -

K Ferricyanide

| | | |
|----|-----|------|
| 1 | 925 | 1035 |
| 2 | 725 | 1010 |
| 3 | 385 | 445 |
| 4 | 520 | 610 |
| 5 | 435 | 575 |
| 7 | 570 | 655 |
| 9 | 740 | 910 |
| 11 | 750 | 990 |

old Fe

247E (2450ft) dark

K Peroxiphate,

| | | |
|----|------|------|
| 1 | 1560 | 1335 |
| 2 | 1640 | 1345 |
| 3 | 1590 | 1360 |
| 4 | 1690 | 1475 |
| 5 | 1695 | 1500 |
| 7 | 1615 | 1430 |
| 9 | 1725 | 1515 |
| 11 | 1755 | 1550 |
| 32 | 1755 | 1430 |

248E (2460ft) Quite dark

K Ethylsulphonate

| | | |
|----|------|------|
| 1 | 1635 | 1675 |
| 2 | 1640 | 1650 |
| 3 | 1575 | 1580 |
| 4 | 1570 | 1625 |
| 5 | 1565 | 1590 |
| 7 | 1505 | 1540 |
| 9 | 1600 | 1615 |
| 11 | 1620 | 1635 |
| 30 | 1248 | 1250 |

Old #2
249E (2480ft)

Quite dark

K Formate

| | | |
|----|------|------|
| 1 | 1425 | 1425 |
| 2 | 1115 | 990 |
| 3 | 1275 | 1180 |
| 4 | 1535 | 1470 |
| 5 | 1585 | 1590 |
| 7 | 1570 | 1475 |
| 9 | 1615 | 1540 |
| 11 | 1600 | 1545 |

250E (2490ft)

Very dark

K Urate

| | | |
|----|------|------|
| 1 | 1590 | 1555 |
| 2 | 1845 | 1820 |
| 3 | 1825 | 1785 |
| 4 | 1790 | 1760 |
| 6 | 1665 | 1640 |
| 8 | 1730 | 1680 |
| 10 | 1765 | 1760 |
| 31 | 1580 | 1470 |

olef

251 E (250 att)

fairly dark

K Citrate

| | | |
|----|------|------|
| 1 | 1390 | 1340 |
| 2 | 1360 | 1355 |
| 3 | 1445 | 1435 |
| 4 | 1475 | 1405 |
| 6 | 1390 | 1400 |
| 8 | 1535 | 1475 |
| 10 | 1550 | 1485 |
| 31 | 1385 | 1085 |

252 E (251 att)

dark

K Salicylate.

| | | |
|----|------|------|
| 1 | 1640 | 1650 |
| 2 | 1620 | 1590 |
| 3 | 1665 | 1625 |
| 4 | 1620 | 1620 |
| 6 | 1535 | 1510 |
| 8 | 1600 | 1600 |
| 10 | 1635 | 1600 |
| 31 | 1380 | 1385 |

Qd Fe

253 F (252.0H) all red

K Chloro-Chromate

| | | |
|----|-----|-----|
| 1 | 540 | 475 |
| 2 | 525 | 460 |
| 3 | 590 | 525 |
| 4 | 535 | 475 |
| 6 | 640 | 600 |
| 8 | 600 | 540 |
| 10 | 675 | 600 |

31

254 F (255.0H)

clark

K Metaborate

| | | |
|----|------|------|
| 1 | 1730 | 1645 |
| 2 | 1690 | 1615 |
| 3 | 1690 | 1625 |
| 4 | 1640 | 1610 |
| 6 | 1540 | 1530 |
| 8 | 1610 | 1610 |
| 10 | 1650 | 1650 |
| 31 | 1500 | 1260 |

C-1072

255E (2560H)

Very black

K Sulfocyanate.

| | | |
|----|-----|------|
| 1 | 300 | 440 |
| 2 | 235 | 285 |
| 3 | 255 | 375 |
| 4 | 275 | 420 |
| 6 | 395 | 525 |
| 8 | 520 | 730 |
| 10 | 555 | 725 |
| 31 | 865 | 1290 |

256E (2570H)

all very good

K Ethylsulphuric

| | | |
|----|------|------|
| 1 | 1535 | 1590 |
| 2 | 1490 | 1560 |
| 3 | 1585 | 1625 |
| 4 | 1610 | 1625 |
| 6 | 1540 | 1550 |
| 8 | 1625 | 1625 |
| 10 | 1650 | 1660 |
| 31 | 865 | 1290 |

257 E (259 ott)
 Rochelle Salts.

percent red powder

| | | |
|----|------|------|
| 1 | 1255 | 1375 |
| 2 | 1400 | 1425 |
| 3 | 1530 | 1540 |
| 4 | 1585 | 1600 |
| 6 | 1475 | 1470 |
| 8 | 1615 | 1615 |
| 10 | 1600 | 1600 |
| 31 | 1395 | 1375 |

258 E (260 ott)

black

K Bromide.

| | | |
|----|------|------|
| 1 | 1335 | 1665 |
| 2 | 1260 | 1615 |
| 3 | 1335 | 1720 |
| 4 | 1310 | 1695 |
| 6 | 1275 | 1575 |
| 8 | 1375 | 1635 |
| 10 | 1400 | 1650 |
| 31 | 1365 | 1400 |

259E (262.0H) - black
 Not slightly open on either of the corners -
 K Cyanate.

| | | |
|----|------|------|
| 1 | 1680 | 1585 |
| 2 | 1660 | 1760 |
| 3 | 1665 | 1755 |
| 4 | 1650 | 1710 |
| 6 | 1545 | 1555 |
| 8 | 1620 | 1615 |
| 10 | 1635 | 1620 |
| 31 | 1290 | 1580 |

260E (263.0H)

K Tannate, 10 grms

Semi dark

| | | |
|----|------|------|
| 1 | 1635 | 1715 |
| 2 | 1675 | 1760 |
| 3 | 1720 | 1835 |
| 4 | 1595 | 1670 |
| 5 | 1585 | 1655 |
| 6 | 1625 | 1725 |
| 7 | 1645 | 1780 |
| 8 | 1650 | 1760 |
| 10 | 1635 | 1720 |
| 11 | 1630 | 1685 |

261 E (2650H) ^{CD Fe} Dark.

K Sulphoselenate, 10 gms.

| | | |
|----|------|------|
| 1 | 1850 | 1630 |
| 2 | 1755 | 1925 |
| 3 | 1760 | 1950 |
| 4 | 1715 | 1850 |
| 6 | 1590 | 1720 |
| 8 | 1675 | 1755 |
| 10 | 1700 | 1725 |
| 31 | 1245 | 1585 |

262 E (2660H) Mixed red & black

K Ferric oxalate.

| | | |
|----|------|------|
| 1 | 1885 | 1755 |
| 2 | 1845 | 1645 |
| 3 | 1870 | 1725 |
| 4 | 1825 | 1685 |
| 6 | 1670 | 1590 |
| 8 | 1725 | 1675 |
| 10 | 1720 | 1700 |
| 31 | 1470 | 1500 |

263 E (267 st) ^{old for} Black,
Sodium Bicarbonate.

| | | |
|----|------|------|
| 1 | 1840 | 1785 |
| 2 | 1775 | 1720 |
| 3 | 1815 | 1775 |
| 4 | 1755 | 1755 |
| 6 | 1630 | 1575 |
| 8 | 1700 | 1685 |
| 10 | 1700 | 1700 |
| 31 | 1395 | 1340 |

264 E (268 st) dark,
Sodium acetate.

| | | |
|----|------|------|
| 1 | 1840 | 1850 |
| 2 | 1745 | 1730 |
| 3 | 1760 | 1760 |
| 4 | 1715 | 1785 |
| 6 | 1590 | 1580 |
| 8 | 1685 | 1625 |
| 10 | 1700 | 1635 |
| 31 | 1235 | 1090 |

265E (2690H)
Sodium Cyanide.

cd 7a

Wet

| | | |
|----|------|------|
| 1 | 1675 | 1730 |
| 2 | 1550 | 1650 |
| 3 | 1765 | 1815 |
| 4 | 1745 | 1875 |
| 6 | 1750 | 1780 |
| 8 | 1730 | 1745 |
| 10 | 1735 | 1760 |
| 31 | 1245 | 1345 |

266E (2706H)
Sodium Oxalate,

dark

| | | |
|----|------|------|
| 1 | 1760 | 1800 |
| 2 | 1660 | 1690 |
| 3 | 1730 | 1765 |
| 4 | 1735 | 1755 |
| 6 | 1610 | 1590 |
| 8 | 1635 | 1630 |
| 10 | 1550 | 1540 |
| 31 | 1200 | 1345 |

267E

267E (271 ft) mixed

Sodium Ammonium Phosphate,

| | | |
|----|------|------|
| 1 | 1580 | 1770 |
| 2 | 1535 | 1760 |
| 3 | 1590 | 1875 |
| 4 | 1575 | 1805 |
| 6 | 1465 | 1700 |
| 8 | 1510 | 1730 |
| 10 | 1540 | 1730 |
| 31 | 1115 | 1240 |

268E (2720 ft) mixed

Sodium Hypochlorite -

| | | |
|----|------|------|
| 1 | 1985 | 1855 |
| 2 | 1910 | 1860 |
| 3 | 1935 | 1945 |
| 4 | 1940 | 1890 |
| 6 | 1785 | 1760 |
| 8 | 1815 | 1755 |
| 10 | 1810 | 1790 |
| 31 | 1610 | 1610 |

269[±] (2730 ft) ^{6107₂}

dark.

Na. Bromide

| | | |
|----|------|------|
| 1 | 1960 | 1925 |
| 3 | 1925 | 1920 |
| 4 | 1850 | 1840 |
| 5 | 1755 | 1750 |
| 7 | 1760 | 1725 |
| 28 | 1345 | 1340 |

270[±] (2740 ft)

Red + (dark)

Na. Arseniate -

| | | |
|----|------|------|
| 1 | 1525 | 1650 |
| 3 | 1415 | 1550 |
| 4 | 1400 | 1515 |
| 5 | 1510 | 1630 |
| 7 | 1490 | 1600 |
| 28 | 1180 | 1290 |

271 E (2750 ft) ^{old 72}

used

Na. Phosphate

| | | |
|---|-------|-------|
| 1 | 1690 | 1350 |
| 3 | 1540 | 1290 |
| 4 | 1505 | 1280 |
| 5 | 1640 | 1385 |
| 7 | 1640 | 1380 |
| | 12110 | 10000 |

272 E (2760 ft)

Brown

Na Phenylate

| | | |
|----|------|------|
| 1 | 1615 | 1760 |
| 3 | 1700 | 1790 |
| 4 | 1655 | 1750 |
| 5 | 1760 | 1830 |
| 7 | 1755 | 1810 |
| 28 | 1360 | 1530 |

273 E (277 011) ⁰¹⁰⁷²

Reck

Na Sulphite -

| | | |
|---|------|------|
| 1 | 1860 | 1860 |
| 3 | 1700 | 1720 |
| 4 | 1610 | 1645 |
| 5 | 1680 | 1695 |
| 7 | 1700 | 1810 |

| | | |
|----|------|------|
| 28 | 1440 | 1395 |
| 32 | 1500 | 1475 |
| 33 | 1585 | 1535 |
| 34 | 1565 | 1530 |

CO

274 E (278010)

dark

Na Benzoate.

| | | |
|---|------|------|
| 1 | 1790 | 1715 |
| 3 | 1625 | 1635 |
| 4 | 1570 | 1575 |
| 5 | 1675 | 1675 |
| 7 | 1600 | 1600 |

| | | |
|----|------|------|
| 28 | 1240 | 1217 |
|----|------|------|

275 E (2790 ft) 01072

(161-50)

Na Carbonate

| | | |
|---|------|------|
| 1 | 1895 | 1795 |
| 3 | 1755 | 1705 |
| 4 | 1655 | 1680 |
| 5 | 1760 | 1690 |
| 7 | 1740 | 1780 |

| | | | |
|----|------|------|-----|
| 28 | 1465 | 1290 | C.O |
| 32 | 1550 | 1335 | C.O |
| 33 | 1625 | 1415 | C.O |
| 34 | 1640 | 1410 | |

276 E (2800 ft)

161-50

Na Sulphide Red spots on some parts,

| | | |
|---|------|------|
| 1 | 1585 | 1590 |
| 3 | 1760 | 1670 |
| 4 | 1740 | 1675 |
| 5 | 1790 | 1725 |
| 7 | 1770 | 1750 |

| | | |
|----|------|------|
| 28 | 1660 | 1485 |
| 32 | 1795 | 1625 |
| 33 | 1860 | 1690 |
| 34 | 1875 | 1690 |

277 E (2810tt) ^{CO₂}
Na Chloride,

Black

| | | |
|----|------|------|
| 1 | 1935 | 1720 |
| 3 | 1735 | 1550 |
| 4 | 1680 | 1490 |
| 5 | 1765 | 1585 |
| 7 | 1745 | 1625 |
| 28 | 1395 | 1245 |
| 32 | 1515 | 1285 |
| 33 | 1585 | 1345 |
| 34 | 1565 | 1295 |

Co

278 E (2820tt) all Red
Na Bisulphate,

| | | |
|----|------|------|
| 1 | 1650 | 1720 |
| 3 | 1775 | 1760 |
| 4 | 1735 | 1705 |
| 5 | 1815 | 1785 |
| 7 | 1790 | 1810 |
| 28 | 1250 | 1310 |
| 32 | 1335 | 1475 |
| 33 | 1400 | 1500 |
| 34 | 1365 | 1500 |

Co

279E 0072
(2830tt)

Na Borate.

white)

| | | |
|----|------|------|
| 1 | 1745 | 1850 |
| 3 | 1635 | 1730 |
| 4 | 1565 | 1630 |
| 5 | 1685 | 1725 |
| 7 | 1675 | 1725 |
| 24 | 1205 | 1310 |

280E (2840tt)

Na Salicylate.

white)

| | | |
|----|------|------|
| 1 | 1825 | 1850 |
| 3 | 1700 | 1700 |
| 4 | 1640 | 1650 |
| 5 | 1720 | 1720 |
| 7 | 1710 | 1710 |
| 25 | 1310 | 1310 |
| 32 | 1415 | 1415 |
| 33 | 1450 | 1465 |
| 34 | 1435 | 1465 |

281 E (2850M) ^{OD 72}

Mixed

Na Nitrite

| | | |
|----|------|------|
| 1 | 1780 | 1790 |
| 3 | 1640 | 1560 |
| 4 | 1560 | 1525 |
| 5 | 1685 | 1437 |
| 7 | 1635 | 1600 |
| 28 | 1200 | 1200 |

282 E (2860M)

Mixed

Na. Phosphite

| | | |
|----|------|------|
| 1 | 1660 | 1800 |
| 3 | 1560 | 1645 |
| 4 | 1525 | 1590 |
| 5 | 1645 | 1650 |
| 7 | 1600 | 1715 |
| 28 | 1295 | 1365 |
| 32 | 1355 | 1420 |
| 33 | 1400 | 1500 |
| 34 | 1365 | 1465 |

CO

0072
283 E (2870 ft)

all seed

Na Sulfate

| | | |
|---|------|------|
| 1 | 1680 | 1575 |
| 3 | 1670 | 1560 |
| 4 | 1615 | 1515 |
| 5 | 1695 | 1600 |
| 7 | 1640 | 1600 |

| | | |
|----|------|------|
| 24 | 1365 | 1215 |
| 32 | 1415 | 1220 |
| 33 | 1415 | 1280 |
| 34 | 1415 | 1285 |

(2)

284 E (2880 ft)

Mixed

Na Biphosphate

| | | |
|---|------|------|
| 1 | 1275 | 1445 |
| 3 | 1435 | 1550 |
| 4 | 1400 | 1515 |
| 5 | 1600 | 1640 |
| 7 | 1535 | 1645 |

| | | |
|----|------|------|
| 24 | 1200 | 1200 |
|----|------|------|

285 E ⁰⁰⁷² (2890tt)
Na Fluoride

Mixed

| | | |
|----|------|---|
| 1 | 1605 | X |
| 2 | 1680 | X |
| 5 | 1565 | — |
| 6 | 1635 | — |
| 7 | 1650 | — |
| 8 | 1670 | — |
| 10 | 1625 | |
| 11 | 1600 | |

286 E (2900tt)
Na Tartrate

Mixed

| | | |
|----|------|------|
| 1 | 1600 | 1550 |
| 2 | 1555 | 1250 |
| 5 | 1520 | 1415 |
| 6 | 1590 | 1530 |
| 7 | 1645 | 1635 |
| 8 | 1635 | 1600 |
| 10 | 1625 | 1565 |
| 11 | 1595 | 1545 |

Manganese Bad

287 E (291.0tt) 01272

Brown

Na Manganate.

| | | |
|----|------|------|
| 1 | 1100 | 1155 |
| 2 | 650 | 750 |
| 5 | 845 | 860 |
| 7 | 915 | 940 |
| 8 | 955 | 945 |
| 10 | 875 | 880 |
| 11 | 855 | 870 |

288 E (292.0tt)

black

Na Chromate.

| | | |
|----|------|------|
| 1 | 1610 | 1615 |
| 2 | 1685 | 1670 |
| 3 | 1600 | 1585 |
| 4 | 1650 | 1640 |
| 6 | 1660 | 1650 |
| 7 | 1570 | 1565 |
| 9 | 1555 | 1525 |
| 10 | 1525 | 1500 |

| | | |
|----|------|------|
| 26 | 950 | 1450 |
| 27 | 1235 | 1450 |
| 28 | 1245 | 1360 |
| 29 | 1125 | 1500 |
| 30 | 1200 | 1310 |
| 31 | 1130 | 1220 |

Net 500-1415

289 F (2930 ft)
Na Stannate

light yellow

| | | |
|---|------|------|
| 1 | 1710 | 1550 |
| 2 | 1665 | 1485 |
| 3 | 1565 | 1460 |
| 4 | 1655 | 1540 |
| 5 | 1735 | 1645 |
| 6 | 1450 | 1490 |
| 7 | 1740 | 1675 |
| 8 | 1695 | 1635 |

12

290 F (2940 ft)

Mixed

Na Sulphacarbonate.

| | | |
|---|------|------|
| 1 | 1200 | 1150 |
| 2 | 1600 | 1400 |
| 3 | 1795 | 1655 |
| 4 | 1520 | 1725 |
| 5 | 1850 | 1790 |
| 6 | 1830 | 1750 |
| 7 | 1790 | 1645 |
| 8 | 1770 | 1665 |

| | | |
|----|------|------|
| 26 | 1105 | 1165 |
| 27 | 1605 | 1600 |
| 28 | 1720 | 1720 |
| 29 | 1745 | 1740 |
| 30 | 1800 | 1765 |
| 31 | 1835 | 1835 |

Net 1425-1425

| | | |
|----|------|------|
| 26 | 2060 | 1355 |
| 27 | 1935 | 1260 |
| 28 | 1720 | 1345 |
| 29 | 1665 | 1190 |
| 30 | 1595 | 1265 |
| 31 | | |

Alt 1450 - 1255

CA7c
291E (2950t)

12.1.76

Na Peroxide 10 grains - Violent reaction

| | | |
|----|------|------|
| 1 | 1890 | 1315 |
| 2 | 1820 | 1400 |
| 5 | 1700 | 1320 |
| 7 | 1780 | 1485 |
| 8 | 1870 | 1500 |
| 10 | 1775 | 1455 |
| 11 | 1770 | 1440 |

292E (2960t)

Mixed

Na Butyrate

| | | |
|----|------|------|
| 1 | 1550 | 1985 |
| 2 | 1500 | 1985 |
| 5 | 1415 | 1775 |
| 7 | 1590 | 1860 |
| 8 | 1595 | 1875 |
| 10 | 1570 | 1810 |
| 11 | 1565 | 1790 |

Chambers Bay

293E CD72
(2970E)

Yellowstone

Na Bicarbonate

| | | |
|----|------|------|
| 1 | 1120 | 1135 |
| 2 | 865 | 855 |
| 3 | 754 | 760 |
| 7 | 920 | 915 |
| 8 | 955 | 954 |
| 10 | 875 | 875 |
| | | CO |

294

| | | |
|--------|------|------|
| 1 | 950 | 927 |
| 2 | 1115 | 1130 |
| 3 | 1150 | 1130 |
| 4 | 1160 | 1170 |
| 5 | 1217 | 1220 |
| 6 | 1273 | 1243 |
| 7 | 1263 | 1267 |
| 9 | 1277 | 1283 |
| 10 | 1287 | 1297 |
| No. 10 | | |
| 21 | 1433 | 1440 |
| 22 | 1413 | 1417 |
| 23 | 1383 | 1390 |
| 64 | 1300 | 1383 |
| 65 | 1307 | 1340 |
| 66 | 1290 | 1323 |
| 117 | 983 | 780 |
| 118 | 1360 | 1367 |
| 119 | 1360 | 1407 |

Hot 553-550

Hot 553-790

No. any better
than Regular

294 - Ray green, hot soaked
48 hours in hot concentrated

Nickel Chloride - both hot
when put together ~~are~~
no excess liquid ~~is~~ no free
liquid but still very moist
outside each particle.

Dried -

Then put in 20% (NaOH)

24 hours -

Then washed repeatedly
off of CP as tested
by 21g Nitrate -

Bath sent to Buchanan
with invoice for
Anchor Co. Newark -
C 294-4 295 -

295

| | | |
|----|------|------|
| 1 | 717 | 583 |
| 2 | 973 | 933 |
| 3 | 1000 | 983 |
| 4 | 1060 | 1020 |
| 5 | 1107 | 1060 |
| 6 | 1110 | 1077 |
| 7 | 1167 | 1133 |
| 9 | 1200 | 1197 |
| 10 | 1200 | 1183 |

| | | |
|----|------|------|
| 21 | 1360 | 1340 |
| 22 | 1427 | 1417 |
| 23 | 1413 | 1400 |

| | | |
|----|------|------|
| 64 | 1110 | 1090 |
|----|------|------|

| | | |
|----|------|------|
| 65 | 1167 | 1100 |
|----|------|------|

| | | |
|----|------|------|
| 66 | 1090 | 1080 |
|----|------|------|

| | | |
|-----|------|------|
| 117 | 1040 | 1047 |
|-----|------|------|

| | | |
|-----|------|------|
| 118 | 1063 | 1073 |
|-----|------|------|

| | | |
|-----|------|------|
| 119 | 1063 | 1077 |
|-----|------|------|

Bath up 633-637

Bath up 1240-1277

(Heat under and then)

DuCoL - 3pm Monday

295-

Same as 294. but Not
Cone Cobalt Chlorideused - it was put in
when NiO₂ was hot,~~It~~ Treated exactly
as Nickel chl was -Bath made up in
short tubes for test
& Endurance -(Tubes used just as come from
Smith - they may be
full of KOH,
I heat them on steam
plate -

296¹/₂ old 173E old 4 yr mi -
Run by Smith 23 times - finally set & shot.
871-833 - Dressed 48 hours in
Cone Co Cl cold & treated 20% NaOH.
Washed free.

200 243 X

297¹/₂ old 174E treated
Cone Co Cl cold 48 hours

| 61 | IV | 1/2 | IV | 1/2 |
|----|-------|-------|-------|-------|
| 61 | 172.5 | 182.5 | 100 | 112.5 |
| 62 | 180 | 189 | 91.5 | 113 |
| 63 | 182.5 | 188.5 | 120 | 132 |
| 64 | 183.5 | 190.7 | 10.8 | 191.5 |
| 65 | 183 | 189 | 23.3 | 52.9 |
| 66 | 182.5 | 193 | 175.5 | 183.5 |
| 67 | 190 | 193.5 | 180 | 186.2 |
| 68 | 183 | 193.5 | 180 | 192.5 |
| 69 | 190 | 197.5 | 178.2 | 190.7 |
| 70 | 181 | 191.5 | 178.5 | 197.2 |
| 72 | 180 | 193.5 | 181.2 | 190 |
| 73 | 179 | 188.5 | 175.7 | 182.5 |
| 74 | 183.7 | 188.2 | 181.2 | 190 |
| 75 | 185.5 | 196.5 | 176.5 | 184 |
| 76 | 180 | 192.5 | 184.5 | 193 |
| 77 | 187.5 | 197 | 180 | 189 |
| 78 | 185.0 | 190 | 50 | 125 |
| 79 | 182.2 | 193.2 | 58.2 | 130 |
| 80 | 184.2 | 196.7 | 55.8 | 128.7 |
| 81 | 185 | 198.2 | 148 | 157.5 |
| 82 | 186 | 199.7 | 149.7 | 152.5 |
| 83 | 187.2 | 200.7 | 145 | 150 |
| 84 | 188 | 201.7 | 140 | 145.2 |
| 85 | 189.5 | 202.7 | 137 | 144 |
| 86 | 191 | 203.7 | 136 | 143 |
| 87 | 192 | 204.7 | 135 | 142 |
| 88 | 193 | 205.7 | 134 | 141 |
| 89 | 194 | 206.7 | 133 | 140 |
| 90 | 195 | 207.7 | 132 | 139 |
| 91 | 196 | 208.7 | 131 | 138 |

Cold chrysothry 35.0°

" " " "

High rate 50 amp Cold 85

to wet 70.8

Normal

Equivalent 203.5, 207.5

192.9 194.5

298- old 176 ~~stacked one~~
Co cl card ~~148~~ 11 accs

Must be too deep in E.C. electrode
or it don't penetrate fast enough

Calkett 9V

| 92 | 168 | 177 | 167 | 177 |
|-----|-------|-------|-------|-------|
| 107 | 174 | 187 | 174 | 186.5 |
| 114 | 180 | 188 | 180 | 187.5 |
| 118 | 175 | 188 | 173.2 | 186.2 |
| 159 | 187.5 | 201.2 | 135.7 | 179.5 |
| | 185 | 201 | 180 | 193.7 |

112 Ings.

28

Equivalent to

High rate 100 ohms

" "

" "

Jump 130.5

" "

" "

" "

Normal

" "

| | | |
|----|-------|-------|
| 32 | 174.5 | 174 |
| 33 | 176.2 | 177 |
| 34 | 175 | 178 |
| 35 | 177.5 | 177.5 |
| 36 | 172 | 170.7 |
| 37 | 177.5 | 177.5 |

Cold runs after 6 Hat -

| | | | | |
|----|-------|-------|--------------------|--------------------|
| 35 | 1 V | 9 V | 1 V _{net} | 9 V _{net} |
| 38 | 180 | 189 | 180 | 189 |
| 40 | 179 | 187.5 | 177.5 | 187 |
| 41 | 183.5 | 189 | 180 | 188.5 |
| 42 | 185 | 192 | 183 | 185.7 |
| 43 | 181 | 189.5 | 180.5 | 188.7 |
| 44 | 174.2 | 183 | 175.2 | 181.5 |
| 45 | 182.5 | 190.5 | 181.5 | 188.5 |
| 46 | 176.5 | 186.7 | 175.5 | 186 |
| 47 | 177 | 187 | 176.5 | 186.5 |
| 48 | 175 | 177.5 | 176.5 | 178.5 |
| 49 | 160 | 162 | 160 | 163.2 |
| 50 | 152 | 158.7 | 152.2 | 159 |
| 51 | 140 | 147 | 140 | 147 |
| 52 | 145 | 150 | 143.5 | 145 |
| 53 | 145.5 | 149.2 | 146.5 | 151 |
| 54 | 172.5 | 177.5 | 172.5 | 178.5 |
| 55 | 177.5 | 182.5 | 177.2 | 183.5 |
| 56 | 172.5 | 179 | 174 | 181 |
| 58 | 170 | 179.2 | 173.2 | 183 |
| 59 | 167.2 | 176 | 170 | 177.2 |
| 60 | 178.5 | 183 | 176.7 | 184.5 |

See page 600

gone on Hat 130° Feb

Read 3 hours overcast by moonlight

240 F see bank 1 Regn

Cobalt Conc Dip

112

| Run | 1 V | 1/2 | 1 V | 1/2 |
|-----|-------|-------|-------|-------|
| 1 | 121.7 | 125.7 | 121.2 | 126.2 |
| 2 | 114.5 | 125.5 | 114.7 | 125.5 |
| 3 | 125.8 | 135.0 | 125.5 | 135.2 |
| 4 | 127.0 | 142.5 | 127.0 | 142.5 |
| 5 | 135 | 148.7 | 132.0 | 149.0 |
| 9 | 142 | — | 143 | — |
| 10 | 156.5 | 175.5 | 154.2 | 171.5 |
| 11 | 156 | 173.5 | 154.5 | 170 |
| 12 | 156.5 | 171.2 | 154 | 170.5 |
| 13 | 155 | 173 | 152 | 172 |
| 15 | 165 | 176.5 | 165.5 | 179.5 |

Hat 120° Feb

| | | | | |
|----|-------|---|-------|---|
| 16 | 148 | — | 150 | — |
| 17 | 145 | — | 136 | — |
| 18 | 159.5 | — | 160 | — |
| 19 | 162.5 | — | 162.5 | — |
| 20 | 175.2 | — | 175.2 | — |
| 21 | 160.5 | — | 160 | — |
| 22 | 170 | — | 169.2 | — |
| 23 | 170 | — | 170 | — |
| 24 | 171.5 | — | 171.5 | — |

normal run Regn

Equivalent 174.2 174.2
" 187.8 187.8

No on 6 runs 130° Feb
This capacity is at 130 hat.

6 Hat Run

on board Cal
fringe

| | | |
|----|-------|-------|
| 31 | 170.5 | 170.5 |
|----|-------|-------|

See opposite

241-X-297

| | | | | |
|----|------|------|------|------|
| 1 | 1175 | 1170 | 1250 | 1270 |
| 2 | 1180 | 1185 | 1200 | 1265 |
| 3 | 1440 | 1475 | 1400 | 1465 |
| 4 | 1385 | 1490 | 1385 | 1470 |
| 5 | 1400 | 1465 | 1400 | 1495 |
| 6 | 1480 | 1540 | 1450 | 1460 |
| | 1505 | 1525 | 1510 | 1475 |
| 10 | 1455 | 1490 | 1455 | 1460 |
| | 1360 | 1415 | 1345 | 1395 |
| n | 1385 | 1445 | 1335 | 1400 |

297

Marked X

241 E X some Reg $\frac{1}{2}$ mix brown
 Shovel like put in bottle + 6% sol
 of Sulphurous acid put in
 Sol $\frac{1}{2}$ more bulk than mix, it got
 hot from action was in several
 hours, until no more heat (than pound)
 out⁵⁰ put in water, decanted twice, then
 poured on filter, let 3 times water
 go thru then Alcohol twice,
 finally alcohol + went home in
 morning found the Cone hot,
 took it out, + found top part
 hard but

bottom soft + not dry - put all
 Except top part in pig pie plate
 when it commenced to steam
 stirred + let it steam till it stopped
 it jumped a little used pestle
 after top part in bottle
 It is fairly black

Will put up in 5 grams
 packets long way

| | Run 1 | 2 | |
|---|-------|------|------|
| 1 | 320 | 315 | 550 |
| 2 | 600 | 650 | 1085 |
| 3 | 445 | 810 | 1160 |
| 4 | | | 1235 |
| 5 | 1300 | 1424 | 1350 |
| 6 | 1200 | 1300 | |
| 7 | 1295 | 1504 | 1235 |
| 8 | 1055 | 1130 | 1200 |
| 9 | 1120 | 1115 | 1300 |

298
242E X

This is to hard top
part of 241 - on peeling
in place & grinding
it didn't get hot showing it
self heated during the night,

This has a dark ~~brown~~
redish color if you
notice a cloudy - but pretty
dark -

The Hot capacity 20th Run

433 507

The

483 433

383 433

2.94 X
243 E old 173 E from Smith sanded
H₂O (vacuum) Cobalt Chloride
then 20% wash occurred —

| | | | | | |
|---|-----|-----|----|-----|------|
| 1 | 327 | 420 | 8 | 667 | 857 |
| 2 | 500 | 610 | 9 | 707 | 900 |
| 3 | 550 | 673 | 10 | 693 | 690 |
| 4 | 607 | 740 | 21 | 587 | 933 |
| 5 | 636 | 810 | 22 | 910 | 1017 |
| 6 | 647 | 832 | 23 | 957 | 1033 |
| 7 | 683 | 867 | | | |

Hot 10

X 244 E same but old 174 E in
Cobalt

| | | | | | |
|---|-----|-----|----|------|------|
| 1 | 417 | 357 | 8 | 760 | 857 |
| 2 | 580 | 540 | 9 | 807 | 777 |
| 3 | 640 | 603 | 10 | 713 | 760 |
| 4 | 700 | 667 | 21 | 953 | 907 |
| 5 | 730 | 673 | 22 | 1007 | 977 |
| 6 | 743 | 723 | 23 | 1023 | 1007 |
| 7 | 773 | 773 | | | |

10 flat

X 245 E old 170 E
sanded Cobalt chloride —

| | | | | | |
|---|-----|-----|----|-----|------|
| 1 | 333 | 433 | 8 | 617 | 820 |
| 2 | 463 | 617 | 9 | 667 | 800 |
| 3 | 510 | 680 | 10 | 660 | 850 |
| 4 | 557 | 750 | 21 | 767 | 1000 |
| 5 | 580 | 783 | 22 | 853 | 1043 |
| 6 | 610 | 797 | 23 | 907 | 1067 |
| 7 | 640 | 820 | | | |

10 flat

246 -

246

| | | |
|---|------|------|
| 1 | 1785 | 1785 |
| 2 | 1785 | 1800 |
| 3 | 1860 | 1875 |
| 5 | 1760 | 1800 |
| 6 | 1800 | 1870 |
| 7 | 1800 | 1870 |
| 8 | 1895 | 1895 |

247

| | | |
|---|------|------|
| 1 | 1790 | 1790 |
| 2 | 1800 | 1785 |
| 3 | 1875 | 1850 |
| 5 | 1800 | 1750 |
| 6 | 1875 | 1815 |
| 7 | 1885 | 1840 |
| 8 | 1820 | 1765 |

248

| | | |
|---|------|------|
| 1 | 1580 | 1600 |
| 2 | 1685 | 1735 |
| 3 | 1800 | 1850 |
| 5 | 1725 | 1750 |
| 6 | 1780 | 1820 |
| 7 | 1775 | 1740 |
| 8 | 1700 | 1735 |

| | | |
|----|------|------|
| 10 | 1750 | 1895 |
| 11 | 1775 | 1880 |
| 12 | 1760 | 1825 |
| 26 | 1850 | 1850 |
| 27 | 1835 | 1840 |
| 30 | 1810 | 1810 |
| 31 | 1770 | 1770 |

10 hot

| | | |
|----|------|------|
| 10 | 1900 | 1845 |
| 11 | 1885 | 1860 |
| 13 | 1880 | 1895 |
| 26 | 1885 | 1820 |
| 27 | 1835 | 1765 |
| 30 | 1465 | 1350 |
| 31 | 1755 | 1595 |

10 hot

| | | |
|----|------|------|
| 10 | 1735 | 1795 |
| 11 | 1725 | 1790 |
| 13 | 1755 | 1845 |
| 26 | 1895 | 1840 |
| 27 | 1770 | 1780 |
| 30 | 1820 | 1855 |
| 31 | 1595 | 1700 |

10 hot

302
246 EX232E ground there 100 m.c.h.
10% ex reg Fe 7 gm C.A.K.303
247E Same as 246 but ground
there 150 m.c.h 7 gm304
248E Same as 246 but ground
there 150 m.c.h 7 gm~~Great~~ S S

| | | |
|----|------|-------|
| | 249 | |
| 1 | 1370 | 1600 |
| 2 | 1385 | 1285 |
| 3 | 1350 | 1300 |
| 5 | 1455 | 1360 |
| 6 | 1500 | 1430 |
| 7 | 1525 | 1505 |
| 9 | 1550 | 1465 |
| 10 | 1540 | 1445 |
| 11 | 1545 | 1485 |
| 13 | 1565 | 1510 |
| | | total |
| 26 | 1085 | 940 |
| 27 | 1325 | 1290 |
| 30 | 1370 | 1375 |
| 31 | 1390 | 1380 |

Note low

305
249 E X

This is *Ferrous ammonium*
Sulphate Big lot sent up by
Weller —
This sample mixed with

5% H₂O Saline solution with

Lithia hydroxide —

2000 lbs placed in Disc mould
in Reg 12" Round Disc press

It was not heated on plate
It got just barely warm —

Used 2 lbs to each Disc
disc loaded unevenly only 2/3
was hard enough to break &
pass thru 10 mesh
It looks fair but considerable
fines in —

Mother is to feed 2 bags
each kind & then send
balance to Works to
test if it finds OK —

250

| | | |
|----|------|------|
| 1 | 1265 | 1275 |
| 2 | 1115 | 1290 |
| 3 | 1230 | 1340 |
| 5 | 1365 | 1390 |
| 6 | 1425 | 1430 |
| 7 | 1510 | 1510 |
| 8 | 1465 | 1495 |
| 10 | 1455 | 1455 |
| 11 | 1500 | 1500 |
| 13 | 1535 | 1535 |
| 26 | 960 | 960 |
| 27 | 1450 | 1450 |
| 30 | 1400 | 1420 |
| 31 | 1400 | 1415 |

10 that

306
 250 E^X Sup of 249 but
 lost with 5% of 21 Kst,
 however is slightly in
 favor of Kst.

251

| | | |
|----|------|------|
| 1 | 1175 | 1270 |
| 2 | 1165 | 1275 |
| 3 | 1160 | 1320 |
| 5 | 1260 | 1400 |
| 6 | 1300 | 1430 |
| 7 | 1250 | 1510 |
| 8 | 1405 | 1510 |
| 10 | 1360 | 1520 |
| 11 | 1395 | 1550 |
| 13 | 1450 | 1590 |
| 26 | 870 | 1490 |
| 27 | 1300 | 1590 |
| 30 | 1335 | 1400 |
| 31 | 1395 | 1420 |

252

| | | |
|----|------|------|
| 1 | 1170 | 1170 |
| 2 | 1260 | 1250 |
| 3 | 1300 | 1265 |
| 5 | 1385 | 1355 |
| 6 | 1445 | 1350 |
| 7 | 1505 | 1505 |
| 8 | 1500 | 1465 |
| 10 | 1495 | 1455 |
| 11 | 1545 | 1490 |
| 13 | 1555 | 1500 |

| | | |
|----|------|------|
| 26 | 1345 | 1280 |
| | 1465 | 1440 |
| 30 | 1400 | 1360 |
| 31 | 1395 | 1380 |

1060

307
251 - Lithium salicylate
2 1/2% solution used
to dilute than 5%

308
252 - 2 1/2% 21% ROR
used -

309 to 332
 given to Fred Att
 for his ~~ferocious~~ ^{ferocious} ~~and~~ ^{and} ~~Selfish~~
 Iron ~~practical~~ ^{practical} ~~Expts~~

309-E

| | | |
|----|------|------|
| 1 | 1960 | 1973 |
| 2 | 2054 | 2066 |
| 3 | 2153 | 2167 |
| 4 | 2200 | 2193 |
| 6 | 2133 | 2087 |
| 7 | 2060 | 1987 |
| 11 | 2100 | 2107 |
| 12 | 2060 | 1987 |
| 13 | 2033 | 2013 |
| 14 | 2000 | 2000 |
| 15 | 2053 | 2053 |

1948

| | | |
|----|------|------|
| 28 | 1327 | 1287 |
| 29 | 1567 | 1540 |
| 30 | 1667 | 1720 |
| 31 | 1400 | 1793 |
| 32 | 1720 | 1713 |
| 33 | 1833 | 1827 |

Hot

310E

| | | |
|----|------|------|
| 1 | 1133 | 1667 |
| 2 | 1486 | 1814 |
| 3 | 1453 | 2120 |
| 4 | 1567 | 2267 |
| 6 | 2073 | 2233 |
| 7 | 1980 | 2180 |
| 11 | 2100 | 2313 |
| 12 | 1987 | 2240 |
| 13 | 2007 | 2227 |
| 14 | 1953 | 2193 |
| 15 | 2060 | 2287 |

Hot

| | | |
|----|------|------|
| 28 | 840 | 1567 |
| 29 | 1167 | 1620 |
| 30 | 1653 | 1820 |
| 31 | 1513 | 1827 |
| 32 | 1720 | 1833 |
| 33 | 1820 | 1827 |

1940

311 E

| | | |
|----|------|------|
| 1 | 170 | 1833 |
| 2 | 1840 | 1974 |
| 3 | 2120 | 2213 |
| 4 | 2247 | 2333 |
| 5 | 2233 | 2227 |
| 6 | 2187 | 2200 |
| 7 | 2367 | 2313 |
| 11 | 2213 | 2220 |
| 12 | 2227 | 2220 |
| 13 | 2247 | 2193 |
| 14 | 2333 | 2260 |
| 15 | | |

| | | |
|----|------|-------|
| 28 | 1447 | 1580 |
| 29 | 1413 | 1753 |
| 30 | 1473 | 1757 |
| 31 | 1953 | 1953 |
| 32 | 1907 | 1953 |
| 33 | 1980 | 1957- |

312

313

314

Worked

315 E of ² ~~from~~ ~~Aluminum~~ ~~Dolphin~~ #1945
 316 Iron processed 2000 Lbs, 12" ^{4mm}
 Ram, 4" die - Screen 1mm
 10 mesh + on 100 mesh - loaded in
 Loading Machine - put in frame by
 Smith Iron processed reg reg
 Corrugation

| | | |
|----|------|------|
| 1 | 2054 | 2174 |
| 2 | 2013 | 2200 |
| 3 | 2000 | 2200 |
| 5 | 1960 | 2100 |
| 6 | 1847 | 2300 |
| 8 | 1807 | 2160 |
| 21 | 1573 | 1787 |
| 22 | 1653 | 1767 |
| 23 | 1713 | 1853 |
| 24 | 1673 | 2193 |
| 28 | 1853 | 1803 |
| 29 | 1807 | 1907 |
| 31 | 1827 | 2127 |
| 32 | 1823 | 1987 |
| 36 | 1720 | 1953 |

10 Hat
 Hat 1433-1427

31 2320 2127
 32 2193 1913
 36 2133 1973 Co

317 I
 318 Same as 315 } Exception
 Clamped with 6th No 2, Company
 Die

| | | |
|---|------|------|
| 1 | 2220 | 2134 |
| 2 | 2320 | 2200 |
| 3 | 2333 | 2227 |
| 5 | 2227 | 2133 |
| 6 | 2187 | 1993 |
| 8 | 2153 | 1953 |

10 Hat Hat exp 1427-1427

| | | |
|----|------|------|
| 21 | 1600 | 1600 |
| 22 | 1807 | 1773 |
| 23 | 2053 | 1977 |
| 24 | 2070 | 1853 |
| 28 | 2240 | 1940 |
| 29 | 2207 | 2053 |

P

No 2 die

| | | |
|----|------|------|
| 31 | 2320 | 2253 |
| 32 | 2227 | 2150 |
| 36 | 2187 | 1967 |

Co

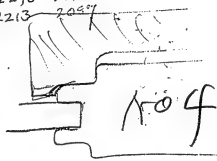
319/E
 320 { Same as 315
 Crimped with 5th No 3
 Crimping Dies -

| | | |
|---|------|------|
| 1 | 2286 | 2214 |
| 2 | 2353 | 2133 |
| 3 | 2375 | 2227 |
| 5 | 2273 | 2167 |
| 6 | 2208 | 2086 |
| 8 | 2233 | 2060 |

| | | |
|----|------|------|
| 21 | 1767 | 1767 |
| 22 | 1713 | 1713 |
| 23 | 2093 | 1927 |
| 24 | 2013 | 1960 |
| 28 | 2240 | 2120 |
| 29 | 2213 | 2097 |

12 Hat Hat Cap } 1593-1413

Just pressure
 little only



| | | |
|----|------|------|
| 21 | 1925 | 1820 |
| 22 | 1927 | 1820 |
| 23 | 1927 | 1801 |
| 24 | 1953 | 1847 |
| 28 | 2150 | 2020 |
| 29 | 2200 | 1843 |
| 31 | 2260 | 2120 |
| 32 | 2150 | 1993 |
| 36 | 2100 | 1847 |

- Hot was 1473-1420

Co

Ferron Mts. 503 Iron 1945 gsm

322⁶
322⁵ Moist with 5% of a 5/2 sol
of Rott, pressed 2000 lbs in
die. 4" die 200 gsm Cakes -
ground & screened 10 on 100
packed in loading 1000 per ton
from 6 months when packed
at Corrugated Paper

| | | |
|---|------|------|
| 1 | 2260 | 2346 |
| 2 | 2253 | 2340 |
| 3 | 2227 | 2267 |
| 5 | 2130 | 2093 |
| 6 | 1980 | 1980 |
| 8 | 1920 | 1907 |

~~28 2120 2020~~

~~ABC~~
~~2000~~

| | | | |
|----|------|------|----------------------|
| 21 | 713 | 1533 | H of war 1473 - 1480 |
| 22 | 927 | 1757 | |
| 23 | 2140 | 1947 | |
| 24 | 2153 | 2060 | |
| 28 | 2333 | 2240 | |
| 29 | 2353 | 2300 | |
| 31 | 2453 | 2333 | |
| 32 | 2363 | 2187 | Co |
| 36 | 3327 | 2033 | |

323 (Same as 321-22 except
 324) Cramped off No 2 line -

| | | |
|---------------|-----------------|-----------------|
| 1 | 2166 | 2066 |
| 2 | 2319 | 2140 |
| 3 | 2373 | 2160 |
| 5 | 2307 | 2153 |
| 6 | 2253 | 2068 |
| 8 | 2320 | 2067 |
| 26 | 2253 | 2240 |

Hof

~~3260~~ OK

| | | |
|----|------|------|
| 21 | 1987 | 1920 |
| 22 | 1928 | 2250 |
| 23 | 2147 | 2300 |
| 24 | 2193 | 2213 |
| 28 | 2260 | 2353 |
| 29 | 2353 | 2367 |
| 31 | 2347 | 2427 |
| 32 | 2427 | 2347 |
| 36 | 2247 | 2327 |

Not over 1540-1527

Co

325 F Same as 321-2 except
326 Cramped in Otto No (3) Lie-

probably 2

| | | |
|---|------|------|
| 1 | 2139 | 2134 |
| 2 | 2233 | 2226 |
| 3 | 2227 | 2227 |
| 5 | 2133 | 2133 |
| 6 | 2267 | 2267 |
| 8 | 2127 | 2087 |

| | | |
|----|------|------|
| 21 | 1467 | 1360 |
| 22 | 2320 | 1953 |
| 23 | 1977 | 1913 |
| 24 | 1967 | 1950 |
| 28 | 2187 | 2100 |
| 29 | 2208 | 2087 |
| 31 | 2267 | 2260 |
| 32 | 2267 | 2087 |
| 36 | 2207 | 2053 |

Ref. 1653-1180

Co

327 E Ferrans Wt. 450g 1945 Ym
328 E

Mounded with 5% of 2 1/2" Rott
pressed 2000 lbs 12" Rms 4" doo
ground 10m 10 mesh on 100
Loaded in weighing put in
frame by Quigley, man used
Req dig, C. Cor

| | | |
|---|------|------|
| 1 | 2040 | 2026 |
| 2 | 2100 | 2113 |
| 3 | 2133 | 2227 |
| 5 | 2133 | 2133 |
| 6 | 2150 | 2180 |
| 8 | 2060 | 2033 |

| | | |
|----|------|------|
| 21 | 1627 | 1573 |
| 22 | 2153 | 1956 |
| 23 | 1517 | 1927 |
| 24 | 1547 | 1953 |
| 28 | 2053 | 2060 |
| 29 | 2067 | 2057 |
| 31 | 2266 | 2127 |
| 32 | 2093 | 1987 |
| 36 | 2033 | 2047 |

Notion 1487-1547

329 } Dup 327-8 except
330 } Cramped Offs No 2 die

| | | |
|---|------|------|
| 1 | 1934 | 1906 |
| 2 | 2013 | 2027 |
| 3 | 2100 | 2127 |
| 5 | 2033 | 2113 |
| 6 | 2000 | 2120 |
| 8 | 1867 | 1980 |

| | | |
|----|------|------|
| 21 | 1533 | 1533 |
| 22 | 2000 | 2000 |
| 23 | 2053 | 2000 |
| 24 | 2067 | 2087 |
| 25 | 2020 | 2000 |
| 26 | 2093 | 2013 |
| 28 | 2193 | 2167 |
| 29 | 2233 | 2193 |
| 31 | 2253 | 2233 |
| 32 | 2193 | 2167 |
| 36 | 2000 | 2000 |

Notion 1593-1700

T

331 $\frac{1}{2}$ Dup 327-8 - except
 332 $\frac{1}{2}$ Crumpled Offs no 3 die -

| | | |
|---|------|------|
| 1 | 1826 | 1814 |
| 2 | 2007 | 1960 |
| 3 | 2133 | 2113 |
| 5 | 2133 | 2120 |
| 6 | 2143 | 2013 |
| 8 | 2000 | 1907 |

probably ~~the~~
 die

252 BX

| | | |
|----|------|------|
| 1 | 1967 | 1987 |
| 2 | 2060 | 2090 |
| 3 | 2100 | 2153 |
| 6 | 1973 | 1960 |
| 7 | 1853 | 1893 |
| 9 | 1867 | 1833 |
| 26 | 1713 | 1713 |

2 hours overage

8 gram Ferron Alumon Sulphate Shrink
Loaded by Archer
No. 11172

249 BX

Marked BX

| | | |
|---|------|------|
| 1 | 1707 | 2120 |
| 2 | 1740 | 2096 |
| 3 | 1813 | 2060 |
| 4 | 1820 | 2000 |
| 6 | 1787 | 1953 |
| 7 | 1746 | 1853 |
| 9 | 1807 | 1800 |

250 BX

| | | | | | | |
|---|------|------|----|------|------|-----------------|
| 1 | 2060 | 2073 | 26 | 1713 | 1820 | 2 hours overage |
| 2 | 2094 | 2080 | 27 | 2180 | 1847 | |
| 3 | 2087 | 2153 | | | | |
| 4 | 2130 | 2133 | | | | |
| 6 | 1993 | 2007 | | | | |
| 7 | 1893 | 1900 | | | | |
| 9 | 1867 | 1913 | | | | |

H₂O

251 BX

| | | | | | | |
|---|------|------|----|------|------|-----------------|
| 1 | 2053 | 2000 | 26 | 1987 | 1720 | 2 hours overage |
| 2 | 2080 | 2054 | 27 | 2500 | 2200 | |
| 3 | 2153 | 2120 | | | | |
| 4 | 2160 | 2107 | | | | |
| 6 | 2080 | 1987 | | | | |
| 7 | 2000 | 1853 | | | | |
| 9 | 1980 | 1913 | | | | |

333

| | | |
|----|------|------|
| 19 | 2633 | 2400 |
| 20 | 1387 | 1700 |
| 21 | 1870 | 1750 |
| 22 | 1875 | 1725 |
| 23 | 2713 | 2667 |
| 24 | 2550 | 2567 |
| 25 | 2667 | 2625 |
| 26 | 2613 | 2533 |
| 27 | 2567 | 2500 |
| 28 | 1937 | 1775 |
| 29 | 1447 | 1550 |
| 30 | 2840 | 2747 |
| 31 | 2867 | 2667 |
| 32 | | |

334

| | | |
|----|------|------|
| 19 | 2647 | 2380 |
| 20 | 1850 | 1850 |
| 21 | 1937 | 1925 |
| 22 | 1687 | 1975 |
| 23 | 2833 | 2773 |
| 24 | 2767 | 2587 |
| 25 | | 2520 |
| 26 | 2707 | 2440 |
| 27 | 2567 | 2447 |
| 28 | 1975 | 2000 |
| 29 | 2087 | 1973 |
| 30 | 2740 | 2760 |
| 31 | | 2750 |
| 32 | | |

750 rate

| | | | |
|---------------|----|------|------|
| Normal | 33 | 2927 | 2907 |
| | 34 | 2773 | 2797 |
| | 35 | 2633 | 2667 |
| Normal | 36 | 1875 | 1975 |
| | 37 | 1682 | 1850 |
| | 38 | 1662 | 1962 |
| Normal | 39 | 2813 | 2820 |
| | 40 | 2750 | 2727 |
| | 41 | 2740 | 2748 |
| | 42 | 2673 | 2690 |
| | 43 | 2640 | 2653 |
| | 44 | 2700 | 2733 |
| face out away | 45 | 2740 | 2747 |
| | 46 | 2633 | 2653 |
| High rate | 47 | 2335 | 2225 |
| Normal | 48 | 3037 | 3067 |
| | 49 | 2667 | 2773 |
| Normal rate | 50 | 2667 | 2773 |
| | 51 | 2667 | 2773 |

333

Press 2 views with 5/16 #4
Crumping die, then die & crumping
Edges only

| | | |
|---|------|------|
| 1 | 2633 | 2633 |
| 2 | 2320 | 2220 |
| 3 | 1900 | 2033 |
| 4 | 1325 | 950 |
| 5 | 1450 | 537 |
| 6 | 1500 | 1187 |
| 7 | 2433 | 1993 |
| 8 | 2400 | 2167 |

Male

4/50 Max. rate

7/50

7/50

Normal

| | | |
|----|------|------|
| 9 | 2540 | 2340 |
| 10 | 2387 | 2080 |
| 11 | 2467 | 2225 |
| 12 | 1387 | 1675 |
| 13 | 1712 | 1357 |
| 14 | 1187 | 800 |
| 15 | 2420 | 2387 |
| 16 | 2387 | 2273 |
| 17 | 2867 | 2660 |
| 18 | 2667 | 2660 |

334

Press 2 views with 5/16 #4
die first - then crump with 7/50
#4 Crumping die

| | | |
|---|------|------|
| 1 | 2620 | 2400 |
| 2 | 2236 | 2173 |
| 3 | 2147 | 2227 |
| 4 | 1300 | 1412 |
| 5 | 1275 | 1600 |
| 6 | 1387 | 1662 |
| 7 | 2313 | 2433 |
| 8 | 2193 | 2440 |
| 9 | 2500 | 2500 |

750 Max. rate

750

750

Normal rate

| | | |
|----|------|------|
| 10 | 2550 | 2387 |
| 11 | 2360 | 2360 |
| 12 | 1712 | 1750 |
| 13 | 1725 | 1937 |
| 14 | 1711 | 1975 |
| 15 | 2420 | 2407 |
| 16 | 2587 | 2527 |
| 17 | 2873 | 2807 |
| 18 | 2547 | 2580 |

333-158Rm 1933-2013
334 158 " 2373 2227

750 rate Continued further on

335

| | | | | | | |
|----|------|------|------------------|----|------|------|
| 19 | 2660 | 2627 | Normal | 33 | 3080 | 2933 |
| 20 | 2087 | 1975 | Normal 350° fahr | 34 | 2967 | 2900 |
| 21 | 2000 | 2000 | " | 35 | 1713 | 1547 |
| 22 | 2137 | 1975 | " | 36 | 1720 | 1520 |
| 23 | 2940 | 2813 | 4000 rate | 37 | 1967 | 1887 |
| 24 | 2880 | 2733 | " | 38 | 809 | 1460 |
| 25 | 2827 | 2780 | " | 39 | 2253 | 2000 |
| 26 | 2787 | 2667 | " | 40 | 2470 | 173 |
| 27 | 2727 | 2440 | " | 41 | 2473 | 353 |
| 28 | 2225 | 1987 | " | 42 | 513 | 453 |
| 29 | 2162 | 2000 | " | 43 | 1900 | 1860 |
| 30 | 2947 | 2600 | High rate | 44 | 1400 | 953 |
| 31 | 2943 | 2760 | " | 45 | 1867 | 1910 |
| 32 | 2943 | 2760 | " | 46 | 160 | 180 |
| | | | " | 47 | 773 | 760 |
| | | | " | 48 | 1867 | 1910 |
| | | | " | 49 | 247 | 227 |
| | | | " | 50 | 2340 | 933 |
| | | | " | 51 | 133 | 167 |
| | | | " | 52 | 3220 | 2367 |

335 E

Upto 34th Run this is best
335

Press 2 rows with #14
(off crumpling die) then
press with point die

| | | | | | | |
|---|------|------|--------------|----|------|------|
| 1 | 2667 | 2533 | 750 rate | 9 | 2453 | 2387 |
| 2 | 2240 | 2133 | " | 10 | 2387 | 2327 |
| 3 | 2207 | 2100 | " | 11 | 2387 | 2260 |
| 4 | 1300 | 1250 | 750-11A rate | 12 | 1737 | 1700 |
| 5 | 1362 | 1297 | " | 13 | 1750 | 1750 |
| 6 | 1387 | 1262 | " | 14 | 1750 | 1627 |
| 7 | 2220 | 2187 | Normal rate | 15 | 2753 | 2587 |
| 8 | 2200 | 2140 | " | 16 | 2620 | 2513 |
| | | | " | 17 | 2447 | 2820 |
| | | | " | 18 | 2447 | 2820 |

336 - 8 run pit piece in off
No 4 die. Then corrugated it
in his old Secy Crumpling die

| | | | | | | |
|----|------|------|--------------|----|------|------|
| 1 | 2620 | 2667 | 750 rate | 13 | 1737 | 1750 |
| 2 | 2133 | 2240 | " | 14 | 1687 | 1650 |
| 3 | 2087 | 2153 | " | 15 | 2553 | 2600 |
| 4 | 1175 | 1250 | 750 Mar rate | 16 | 2587 | 2587 |
| 5 | 1300 | 1350 | " | 17 | 2680 | 2823 |
| 6 | 1250 | 1387 | 750 | 18 | 2687 | 2747 |
| 7 | 2193 | 2220 | Normal rate | | | |
| 8 | 2173 | 2180 | " | | | |
| 9 | 2343 | 2453 | " | | | |
| 10 | 2333 | 2347 | " | | | |
| 11 | 2347 | 2340 | " | | | |
| 12 | 1737 | 1475 | 750 rate | | | |

| | #1 | #2 | Not | |
|----|------|------|--------------|----------------------|
| 34 | 1900 | 1905 | 1942 1224 | normal after 10 kcal |
| 35 | 2090 | 2095 | | |
| 36 | 1715 | 1685 | | |
| 37 | 2100 | 2020 | | |
| 38 | 1950 | 1960 | | |
| 40 | 2230 | 2195 | | |
| 41 | 2260 | 2250 | | |
| 42 | 2055 | 2065 | | CO |

337 E is 1 lb old 4 yr 72
 treadled once 24 hours
 with 600 cc of 3% solⁿ
 of Sulphuric Acid -
~~acid~~ washed 4 or 5
 times quickly in water &
 dried in air 24 hours &
 sent to JRM - pretty yellow -

338 E 2 packets of 337 crushed
 & screened thru 150 mesh 5 grams
 mixed with 2 grams new sec. g
 for breaking of grain packets

| | | | | | |
|----|------|------|----|------|------|
| 1 | 1375 | 1390 | 12 | 2115 | 2115 |
| 2 | 1925 | 1965 | 13 | 2050 | 2110 |
| 3 | 2090 | 2105 | 14 | 2155 | 2145 |
| 4 | 2150 | 2140 | 15 | 2300 | 2275 |
| 5 | 2100 | 2100 | 16 | 2150 | 2170 |
| 5 | 2055 | 2055 | 17 | 2130 | 2130 |
| 5 | 2135 | 2135 | 18 | 2235 | 2195 |
| 5 | 2120 | 2125 | 19 | 2000 | 2000 |
| 5 | 2075 | 2075 | 20 | 2095 | 2085 |
| 10 | 2090 | 2065 | 21 | 1810 | 1805 |
| 11 | 2065 | 2065 | 22 | 2100 | 2100 |
| | | | 23 | 2175 | 2170 |

Heat

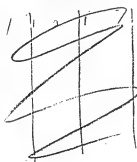
| | | | |
|----|------|------|-------------------|
| 22 | 1800 | 1890 | Hot |
| 23 | 1825 | 1895 | |
| 34 | 1590 | 1735 | 10 knot normal |
| 35 | 1650 | 1930 | |
| 36 | 1800 | 1960 | |
| 37 | 1740 | 1975 | |
| 38 | 1725 | 1980 | |
| 40 | 1975 | 2065 | |
| 41 | 1890 | 1985 | |
| 42 | 1795 | 1940 | |

C

339E is 337 from 150 weeks
2 oxides - 7 grains used no
more iron used -

| | | | | | |
|----|------|------|----|------|------|
| 1 | 580 | 640 | 12 | 1805 | 1835 |
| 2 | 855 | 900 | 13 | 1765 | 1850 |
| 3 | 1400 | 1425 | 14 | 1810 | 1865 |
| 4 | 1795 | 1800 | 15 | 1900 | 2040 |
| 5 | 1800 | 1860 | 16 | 1860 | 1925 |
| 6 | 1820 | 1910 | 17 | 1825 | 1875 |
| 7 | 1850 | 1970 | 18 | 1855 | 1950 |
| 8 | 1830 | 1860 | 19 | 1755 | 1820 |
| 9 | 1790 | 1835 | 20 | 1795 | 1815 |
| 10 | 1750 | 1800 | 21 | 1800 | 1860 |
| 11 | 1750 | 1800 | | | |

340E is 1 lb of old iron
same lot as 337, but not
treated - 7 pr



See 341

| | | |
|----|------|------|
| 13 | 1845 | 1940 |
| 14 | 1935 | 1995 |
| 15 | 2090 | 2145 |
| 16 | 1965 | 2000 |
| 17 | 1775 | 1965 |
| 18 | 2000 | 2110 |
| 19 | 1990 | 1960 |
| 20 | 2100 | 2200 |
| 21 | 2090 | 2110 |
| 22 | 2090 | 2092 |
| 23 | 2040 | 2192 |
| 34 | 1515 | 1500 |
| 35 | 1670 | 1740 |
| 36 | 1320 | 1330 |
| 37 | 1580 | 1625 |
| 38 | 1560 | 1620 |
| 40 | 1725 | 1745 |
| 41 | 1730 | 1725 |
| 42 | 1675 | 1695 |

Not
1275
1720

C

| | | |
|----|------|------|
| 13 | 1590 | 1660 |
| 14 | 1635 | 1800 |
| 15 | 1945 | 1950 |
| 16 | 1720 | 1750 |
| 17 | 1675 | 1730 |
| 18 | 1710 | 1715 |
| 19 | 1630 | 1640 |
| 20 | 1670 | 1675 |
| 21 | 1600 | 1710 |
| 22 | 1570 | 1700 |
| 23 | 1710 | 1745 |

104

| | | |
|----|------|------|
| 34 | 1655 | 1510 |
| 35 | 1740 | 1720 |
| 36 | 1235 | 1215 |
| 37 | 1600 | 1600 |
| 38 | 1550 | 1545 |
| 39 | 1695 | 1655 |
| 40 | 1625 | 1625 |
| 41 | 1510 | 1510 |
| 42 | | |

Not
1275
1720

C

341 - 2 packets - 340 grams
from 150 used 5 grams
mixed with 2 grams used
now -

| | | | | | |
|---|------|------|----|------|------|
| 1 | 1810 | 1885 | 7 | 1980 | 1985 |
| 2 | 1960 | 1990 | 8 | 2000 | 2000 |
| 3 | 1940 | 1985 | 9 | 1920 | 1975 |
| 4 | 1990 | 2000 | 10 | 1870 | 1950 |
| 5 | 1895 | 1980 | 11 | 1870 | 1900 |
| 6 | 1920 | 1920 | 12 | 1890 | 1900 |

342 - Same as 341 but
grams of 340 from 150 -
no need now used -

| | | |
|----|------|------|
| 1 | 1490 | 1560 |
| 2 | 1600 | 1670 |
| 3 | 1625 | 1675 |
| 4 | 1670 | 1720 |
| 5 | 1600 | 1670 |
| 6 | 1650 | 1715 |
| 7 | 1770 | 1770 |
| 8 | 1770 | 1770 |
| 9 | 1685 | 1685 |
| 10 | 1600 | 1665 |
| 11 | 1600 | 1625 |
| 12 | 1690 | 1695 |

Thermos 2
44 with tin

Tin is good - but 335 + 336 Reg iron is 3200. What there is very little advantage in using it. The 3300 7 gm.

| | | | | | | |
|----|------|------|-----|-----|-----|--------------------|
| 13 | 3145 | 3035 | 42 | 855 | 255 | 195-165 of 350 fah |
| 14 | 2975 | 2765 | 43 | 285 | 250 | normal |
| 15 | 2960 | 2930 | 44 | 300 | 285 | |
| 16 | 3050 | 2980 | 46 | 265 | 250 | |
| 17 | 2675 | 2620 | 47 | 285 | 250 | |
| 18 | 2700 | 2615 | 48 | 265 | 270 | |
| 19 | 2750 | 2535 | 50 | 275 | 265 | |
| 20 | 2495 | 2535 | 51 | 280 | 250 | |
| 21 | 2625 | 2575 | 52 | 270 | 190 | |
| 22 | 2090 | 2165 | 104 | | | Hot Cap 1435-1460 |
| 23 | 2540 | 2485 | | | | normal |
| 24 | 2120 | 1860 | | | | |
| 25 | 2375 | 1975 | | | | |
| 26 | 2375 | 1440 | | | | |
| 27 | 170 | 145 | | | | |
| 28 | 150 | 130 | | | | |
| 29 | 150 | 150 | | | | |

NA on low Temp

35° fah

| | | | | | | |
|----|------|------|----|------|------|--------------------|
| 13 | 3350 | 3410 | 35 | 3665 | 3580 | |
| 14 | 3270 | 3100 | 37 | 3670 | 3530 | |
| 15 | 3225 | 3345 | 38 | 335 | 330 | 35° fah |
| 16 | 3320 | 3375 | 39 | 315 | 295 | |
| 17 | 3250 | 3435 | 40 | 285 | 250 | |
| 18 | 3050 | 3085 | 42 | 3740 | 3570 | 210-210 at 35° fah |
| 19 | 3000 | 3200 | 43 | 3830 | 3635 | normal |
| 20 | 3115 | 3170 | 44 | 3725 | 3525 | |
| 21 | 3390 | 3430 | 46 | 3710 | 3545 | |
| 22 | 3615 | 3535 | 47 | 3750 | 3625 | |
| 23 | 3545 | 3520 | 48 | 3695 | 3570 | Hot Cap 1570- |
| 24 | 3525 | 3300 | 49 | 3775 | 3675 | 3570 |
| | | | 50 | 365 | 3570 | 3720 |

343E

Ferrous Molybdate from is not as good as Regular from

This is Ferrous Molybdate 6% by weight up in Tin Can July 20th 1940

20% of Stannous Oxide is mixed with it - Reg 5 grams per 100 750 fah

| | | | | | |
|---|------|------|----|------|------|
| 1 | 3660 | 3200 | 7 | 3070 | 3180 |
| 2 | 2600 | 3225 | 8 | 2537 | 2625 |
| 3 | 3000 | 2920 | 9 | 2557 | 2750 |
| 4 | 2950 | 3070 | 10 | 2412 | 2412 |
| 5 | 3190 | 2580 | 11 | 2600 | 2375 |
| 6 | 3070 | 3100 | 12 | 3125 | 3060 |
| 7 | 3250 | 3270 | | | |

See note

344E Cup of 343E Cut 7 grams per 100 150 fah

| | | | | | |
|---|------|------|----|------|------|
| 1 | 3665 | 3595 | 8 | 2775 | 2910 |
| 2 | 3400 | 3500 | 9 | 2775 | 2775 |
| 3 | 3340 | 3310 | 10 | 2775 | 2900 |
| 4 | 3300 | 3425 | 11 | 2700 | 2700 |
| 5 | 3200 | 3135 | 12 | 3240 | 345 |
| 6 | 3215 | 3310 | | | |
| 7 | 3215 | 3310 | | | |
| | 3295 | 3355 | | | |

300 fah

7/23/40

150 fah

3675

| | | |
|-----|-----|----|
| 12 | 625 | 25 |
| 13 | 25 | 20 |
| 14 | 165 | 40 |
| 15 | 10 | 60 |
| 18 | 70 | 50 |
| 5th | 110 | 5 |

C

345E

Tin reduced by 4 from oxide
 mixed with 3/4 H₂O
 Reversed difference 5 grain Cakes

| | | | | | |
|---|------|-----|----|-----|-----|
| 1 | 65 | 50 | 10 | 825 | 500 |
| 2 | 250 | 250 | 11 | 255 | 535 |
| 3 | 730 | 690 | 12 | 60 | 320 |
| 4 | 1050 | 945 | 13 | 15 | 350 |
| 5 | 1165 | 585 | 14 | 155 | 75 |
| 6 | 650 | 485 | 15 | 20 | 160 |
| 7 | 275 | 475 | 16 | 70 | 10 |
| 8 | 645 | X | 18 | 70 | 10 |
| 9 | 140 | 295 | | | |

346E

Tin reduced by 4 from oxide
 from oxide mixed 3/4 H₂O
 7 grain Cakes

| | | | | | |
|---|------|------|----|-----|------|
| 1 | 75 | 100 | 9 | 970 | 1185 |
| 2 | 260 | 320 | 8 | 765 | 135 |
| 3 | 213 | 915 | 9 | 995 | 35 |
| 4 | 585 | 1125 | 10 | 705 | 65 |
| 5 | 740 | 1000 | 11 | 550 | |
| 6 | 1400 | 1000 | | | |

| | Pressure device | Regular |
|----|-----------------|---------|
| 10 | 2000 | 2200 |
| 11 | 1978 | 2187 |
| 12 | 1987 | 2353 |
| 13 | 2087 | 2253 |
| 14 | 2073 | 2387 |
| 15 | 2033 | 2360 |
| 16 | 1960 | 2213 |
| 17 | 1940 | 2253 |
| 18 | 1853 | 2187 |
| 19 | 1733 | 2370 |

CO

347E

Pressure device pocket
Smith puts 2 bag factory
pockets in runs twice
with no pressure then
twice with it till pressure
goes on increasing pressure
Each 2 runs +

| | Pressure | Regular check |
|----|----------|---------------|
| 1 | 2760 | 2753 |
| 2 | 2200 | 2240 |
| 3 | 1993 | 2153 |
| 4 | 2113 | 2267 |
| 5 | 2087 | 2327 |
| 6 | 2000 | 2260 |
| 7 | 1973 | 2207 |
| 8 | 2000 | 2180 |
| 9 | 1953 | 2167 |
| 10 | 2000 | 2200 |

pressure increased

Screwed up again

Screwed up again before the run

Screwing down

Then repeat no pressure

348E

750 rate

| Reg | Hot | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-------|------|------|------|------|------|------|------|------|------|
| " | 1303 | 1333 | 1267 | 1426 | 980 | 980 | 775 | 1627 | 1255 |
| " | 1195 | 1160 | 1153 | 1175 | 797 | 687 | 650 | 1213 | 970 |
| " | 1190 | 1587 | 1467 | 1534 | 1087 | 1062 | 957 | 1300 | 1270 |
| " | 1150 | 947 | 980 | 994 | 962 | 812 | 862 | 840 | 560 |
| 0th 2 | 1433 | 1187 | 1640 | 1547 | 925 | 1050 | 1225 | 1667 | 1907 |
| " | 1450 | 1147 | 1320 | 1333 | 937 | 975 | 997 | 1907 | 1933 |
| 0th 4 | 1473 | 1347 | 1347 | 1413 | 912 | 962 | 962 | 1867 | 1940 |
| " | 1527 | 1933 | 1933 | 1647 | 1220 | 1325 | 1387 | 2513 | 2187 |

#9 to 18 were hot runs.

450

| Reg | Hot | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 |
|-------|------|------|------|------|------|------|------|------|----|
| " | 1340 | 1447 | 1580 | 1087 | 1087 | 1112 | 1667 | 1840 | |
| " | 1213 | 1180 | 1187 | 737 | 800 | 687 | 947 | 1160 | |
| " | 1233 | 1367 | 1427 | 1012 | 900 | 862 | 1260 | 1540 | |
| " | 760 | 767 | 1120 | 497 | 450 | 437 | 760 | 567 | |
| 0th 2 | 2100 | 1867 | 1833 | 1800 | 1075 | 1150 | 1833 | 1967 | |
| " | 2113 | 2040 | 1967 | 1262 | 1162 | 1257 | 2073 | 2127 | |
| 0th 4 | 2340 | 2107 | 1973 | 1262 | 1162 | 1250 | 2073 | 2133 | |
| " | 2827 | 2633 | 2453 | 1587 | 1537 | 1700 | 2840 | 2693 | |
| Reg | 2613 | 2600 | 2600 | 1800 | 1862 | 1862 | 2633 | 2673 | |
| " | 2647 | 2737 | 2667 | 1912 | 1923 | 1900 | 2620 | 2633 | |
| " | 2653 | 2653 | 2660 | 1916 | 1862 | 1862 | 2573 | 2600 | |
| " | 2667 | 2133 | 2600 | 1475 | 1375 | 1375 | 2150 | 2190 | |
| 0th 2 | 2707 | 2640 | 2647 | 1962 | 1923 | 2012 | 2593 | 2540 | |
| " | 2727 | 2567 | 2587 | 1962 | 1923 | 2012 | 2593 | 2520 | |
| 0th 4 | 2747 | 2607 | 2633 | 1950 | 1937 | 1947 | 2627 | 2583 | |
| " | 2750 | 2567 | 2600 | 1907 | 1973 | 2023 | 2627 | 2520 | |

750

| Reg | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|-------|------|------|------|------|------|------|------|------|
| " | 1973 | 2047 | 2040 | 1275 | 1097 | 767 | 1900 | 1953 |
| " | 1080 | 1173 | 1007 | 650 | 562 | 512 | 940 | 1040 |
| " | 1420 | 1547 | 1293 | 750 | 662 | 25 | 1187 | 1087 |
| " | 647 | 707 | 453 | 250 | 312 | 162 | 400 | 373 |
| 0th 2 | 1820 | 1953 | 1973 | 1375 | 1287 | 1200 | 1707 | 1800 |
| " | 1973 | 2107 | 2100 | 1500 | 1550 | 1450 | 2187 | 2227 |
| 0th 4 | 1973 | 2120 | 2133 | 1500 | 1580 | 1412 | 2180 | 2233 |
| 0th 4 | 2480 | 2620 | 2627 | 1800 | 1675 | 1750 | 2687 | 2573 |

Orignal Solution -

Revised Solution -

| Reg | 57 | 52 | 53 | 54 | 55 | 56 | 57 | 58 |
|-------|------|------|------|------|------|------|------|------|
| " | 1960 | 1953 | 1933 | 1175 | 1187 | 1250 | 1907 | 1967 |
| " | 707 | 677 | 787 | 362 | 423 | 450 | 790 | 733 |
| " | 973 | 907 | 953 | 187 | 520 | 650 | 867 | 720 |
| " | 353 | 347 | 360 | 137 | 175 | 187 | 333 | 300 |
| 0th 2 | 1720 | 1673 | 1680 | 1100 | 1062 | 1000 | 1567 | 1667 |
| " | 2267 | 2160 | 2107 | 1400 | 1387 | 1337 | 2107 | 2133 |
| 0th 4 | 2227 | 2100 | 1970 | 1312 | 1312 | 1162 | 1950 | 1973 |
| " | 2707 | 2467 | 2400 | 1687 | 1562 | 1562 | 2593 | 2527 |

Run above made without or before
renewing solution

Test of Requiron with Reg 4 3485
 Ots die No 2 & reload 750

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--------------|------|------|------|------|------|------|------|------|
| Reg 1999 | 2393 | 1567 | 1753 | 1037 | 1097 | 1000 | 1713 | 1687 |
| " 2000 | 2487 | 2000 | 1933 | 1100 | 1157 | 1000 | 1680 | 1707 |
| 2001 | 2058 | 1967 | 1973 | 1037 | 1000 | 1037 | 1947 | 1813 |
| 2002 | 2360 | 1750 | 1687 | 900 | 937 | 950 | 1680 | 1620 |
| Old No 2 437 | 2587 | 2143 | 2277 | 1412 | 1400 | 1437 | 2253 | 2087 |
| " 438 | 2550 | 2247 | 2320 | 1500 | 1500 | 1600 | 2387 | 2380 |
| Old No 4 439 | 2593 | 2393 | 2427 | 1600 | 1650 | 1637 | 2457 | 2450 |
| 440 | 2623 | 2400 | 2493 | 1725 | 1775 | 1837 | 2747 | 2660 |

Between hot, See page 600

Will run hot 15 more than trial again

No 4 die coming in edge only

See how 4 die comes used possibly it was used with smooth prick die before pressed with 4 die

Smith says no smooth prick die used. No 2 presses under some No 4 don't press center at all only edges

348 Smith

average 1707 $\frac{750}{972}$

Old No 2 2223 1519-

Old No 4 2570 1737-

Reqs only 66% of No 4

+ 750 rate only 55%.

Looks very much as if we wanted porosity in Leon must have Rott in pores to bring about reaction,

Possibly work better yet if not packed so hard in machine & really ferrous ammonium hydroxide used

High die catch rate (see camp & ground)

750 ft. 2 4 2 4 #4 Diebest
High die catch rate

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|----------|
| 20 X | 1437 | 1712 | 1812 | 1875 | 1962 | 2125 | 2150 | 1962 | |
| 21 X | 1412 | 1650 | 1725 | 1725 | 1937 | 2087 | 2112 | 1937 | |
| 22 X | 1375 | 1600 | 1750 | 1725 | 1937 | 2137 | 2137 | 1937 | |
| 23 | 2113 | 2487 | 2493 | 2440 | 2873 | 2907 | 2873 | 2740 | normal |
| 24 | 2060 | 2380 | 2420 | 2313 | 2760 | 2833 | 2920 | 2600 | |
| 25 | 2387 | 2450 | 2415 | 2487 | 3027 | 2947 | 2653 | 2713 | |
| 26 | 2253 | 2573 | 2513 | 2387 | 2920 | 2853 | 2720 | 2687 | |
| 27 | 2243 | 2507 | 2447 | 2327 | 2867 | 2787 | 2687 | 2580 | |
| 28 X | 1412 | 1437 | 1837 | 1950 | 2350 | 2350 | 2137 | 1950 | 750 ft. |
| 29 X | 1587 | 1712 | 1937 | 1937 | 2212 | 2337 | 2125 | 2074 | High die |
| 40 | 2193 | 1847 | 1867 | 1867 | 1920 | 1993 | 2233 | 2267 | High die |
| 40 | 1602 | 2053 | 2093 | 1867 | 2347 | 2400 | 2047 | 1940 | Normal |
| 40 | 1700 | 2100 | 2120 | 1820 | 2400 | 2402 | 2053 | 2000 | |
| 42 | 1760 | 2120 | 2113 | 1947 | 2400 | 2400 | 2107 | 2107 | High die |
| 43 X | 1350 | 1662 | 1662 | 1412 | 1812 | 1857 | 1673 | 1673 | |
| 44 X | 1235 | 1537 | 1530 | 1337 | 1625 | 1820 | 1532 | 1437 | |
| 46 | 2157 | 2540 | 2540 | 2373 | 2647 | 2740 | 2610 | 2467 | Normal |
| 47 | 2297 | 2513 | 2513 | 2333 | 2658 | 2793 | 2633 | 2487 | " |
| 48 | 2333 | 2447 | 2533 | 2460 | 2620 | 2733 | 2533 | 2387 | " |
| 49 | 2167 | 2487 | 2487 | 2387 | 2620 | 2727 | 2453 | 2347 | " |
| 50 | 2093 | 2400 | 2413 | 2207 | 2600 | 2627 | 2400 | 2340 | " |
| 51 X | 1500 | 1800 | 1862 | 1625 | 1662 | 2062 | 1800 | 1662 | High die |
| 52 | 1562 | 1850 | 1862 | 1750 | 2000 | 2162 | 1937 | 1850 | 750 ft. |
| 53 | 1500 | 1812 | 1825 | 1625 | 2000 | 2212 | 1937 | 1850 | |
| 54 | 1494 | 1746 | 1840 | 1836 | 1840 | 2040 | 1756 | 1760 | 750 ft. |
| 55 | 1534 | 1800 | 1826 | 1574 | 1940 | 2080 | 1800 | 1760 | 750 ft. |
| 56 | 1440 | 1774 | 1840 | 1600 | 1944 | 2073 | 1774 | 1776 | " |
| 57 | 1494 | 1774 | 1866 | 1800 | 1960 | 2137 | 1774 | 1760 | 800 ft. |
| 58 | 1520 | 1854 | 1934 | 1666 | 2106 | 2214 | 1934 | 1854 | |
| 59 | 1434 | 1694 | 1800 | 1534 | 1734 | 2030 | 1534 | 1574 | |
| 60 | 1240 | 1737 | 1756 | 1386 | 1734 | 1737 | 1400 | 1600 | 800 ft. |
| 61 | 1240 | 1774 | 1786 | 1425 | 1894 | 1866 | 1241 | 1546 | 800 ft. |
| 62 | 1240 | 1774 | 1786 | 1425 | 1894 | 1866 | 1241 | 1546 | |

349 Fred Ott - Experiment with
Fenners & Munn Sulfate
won in pockets crumpled
Fred Ott die only 1 to 6

Run like 348 Smith - 750 ft.
Fenners & Munn Sulfate
Ott #2 Ott #4 Ott 2 Ott 4

| | | | | | | | | |
|-----|------|------|------|------|------|------|------|-------|
| 1 | 2000 | 2033 | 1967 | 1660 | 2667 | 2592 | 2587 | 2533 |
| 2 | 1987 | 2033 | 2133 | 1847 | 2120 | 2133 | 2173 | 2173 |
| 3 | 2000 | 2213 | 2160 | 1973 | 2113 | 2113 | 2213 | 2207 |
| 4 X | 1312 | 1450 | 1287 | 1312 | 1525 | 1450 | 1450 | 1516* |
| 5 X | 1275 | 1387 | 1257 | 1257 | 1487 | 1487 | 1402 | 1473 |
| 6 X | 1312 | 1450 | 1525 | 1437 | 1287 | 1312 | 1450 | 1512 |
| 7 | 2213 | 2373 | 2460 | 2075 | 2353 | 2353 | 2507 | 2477 |
| 8 | 2067 | 2280 | 2327 | 2280 | 2233 | 2233 | 2387 | 2460 |
| 9 | 2047 | 2453 | 2473 | 2467 | 2453 | 2453 | 2520 | 2520 |
| 10 | 2147 | 2320 | 2407 | 2300 | 2413 | 2413 | 2387 | 2387 |
| 11 | 2107 | 2320 | 2400 | 2280 | 2413 | 2413 | 2513 | 2512 |
| 12 | 1437 | 1587 | 1650 | 1625 | 1625 | 1750 | 1775 | 1775 |
| 13 | 1412 | 1500 | 1612 | 1580 | 1615 | 1712 | 1767 | 1712 |
| 14 | 1350 | 1525 | 1637 | 1562 | 1687 | 1757 | 1837 | 1775 |
| 15 | 2200 | 2427 | 2547 | 2500 | 2647 | 2647 | 2713 | 2680 |
| 16 | 2267 | 2593 | 2680 | 2647 | 2847 | 2847 | 3147 | 2647 |
| 17 | 2347 | 2573 | 2647 | 2640 | 2800 | 2873 | 3067 | 2653 |
| 18 | 2347 | 2533 | 2587 | 2540 | 2773 | 2840 | 2920 | 2600 |

As $1\frac{1}{2}\%$ comes
off surface this
leaves $3\frac{1}{2}\%$ after
250 times, 18 gms Nickel
less than $1\frac{1}{2}\%$
of the total
Nickel.

$\frac{5}{10}$ of the total
Nickel.

2 Cells that Smith some time ago
Took out regular clock for
up & run surface about
250 times, got a little less
than it should - Cut them
open & found about
185 gms. Nickel in each
A4 - Mostly Nickel -
get superdepos

Took 2 more A4, found
just ready to ship - Cut
open - following analysis

| #1 | #2 |
|------------------|--------------|
| 25 gms. Sediment | 23 gms |
| Sediment: 100% | |
| 1.4% Hg | 0.77% Hg |
| 22.39% Fe | 15.39% Fe |
| 45.49% Ni | 52.05% Ni |
| 0.3% msp | 0.3% msp |

Cell number 7318B 7444B

350E is Sup of Reg No. 4.
 from 4 like No. 4968 -
 is about 1 inch, to continue
 on hot test

| | | |
|--------------------|------|------|
| In reg test it was | 1290 | 1463 |
| 50 | 1293 | 1423 |

| | | |
|------|------|------------------|
| 1283 | 117 | Something Rotten |
| 1287 | 1067 | |

| V | .9v | |
|-----|-------|-------|
| 173 | 175.5 | 182 |
| 174 | 181.2 | 186 |
| 176 | 183 | 186 |
| 177 | 179 | 182 |
| 178 | 175.7 | 179.2 |
| 179 | 167.5 | 171.7 |
| 180 | 185 | 188.7 |
| 181 | 175.7 | 180 |
| 182 | 175 | 180 |
| 183 | 37.5 | 91.7 |
| 182 | 56.7 | 126.7 |
| 185 | 42.8 | 103.7 |
| 186 | 175 | 183 |
| 187 | 175.5 | 182.5 |
| 188 | 180 | 186.5 |
| 189 | 177.5 | 184 |
| 190 | 180 | 187.5 |
| 191 | 183.2 | 187.2 |
| 192 | 178.5 | 182.5 |
| 194 | 174 | 178.5 |
| 208 | 203.5 | 206.7 |
| 215 | 200 | 202 |
| 219 | 200 | 204 |
| 260 | 198 | 202.7 |
| 269 | 146 | 200 |

High rate

130 fahs

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Bismuth Cells seems
no good on heavy disch
rate. Think the Iron has
gone bad - put in cell 4
dis 7 gram Iron

3516

Bismuth Cells 2 F. T. & no. Ki plate
11. Rate 621 Bism -

120 fahs

1/2

dist.

Normal Temp

| Run | 148 | 148 | 148 |
|-----|-------|-------|-------------|
| # | 148 | 148 | 148 |
| 149 | 210.7 | 199 | |
| 150 | 161 | 192 | |
| 151 | 192 | 193.5 | |
| 152 | 193.5 | 193 | |
| 153 | 193 | 192.5 | |
| 154 | 192.5 | 189.5 | |
| 155 | 189.5 | 189 | |
| 156 | 189 | 191 | |
| 157 | 192.5 | 194.5 | 130 fahs |
| 159 | 193 | 195.5 | " |
| 160 | 183.5 | 187.5 | " |
| 161 | 183.7 | 187.2 | " |
| 162 | 187 | 188.5 | " |
| 163 | 194.7 | 200 | " |
| 164 | 202.5 | 205.5 | " |
| 165 | 192.5 | 197.2 | " |
| 166 | 197.5 | 202.5 | " |
| 167 | 191.5 | 195.5 | Normal Temp |
| 168 | 185 | 190 | " |
| 169 | 179 | 183 | " |
| 170 | 170 | 175 | " |
| 171 | 172.5 | 178.5 | |
| 172 | 175 | 178.5 | |

352

| | V | 1/2 | V | 1/2 |
|----|-------|-------|-------|-------|
| 6 | 78 | 96.5 | 70.0 | 96.6 |
| 7 | 67.5 | 95.5 | 67.5 | 95.5 |
| 8 | 75 | 97.9 | 76 | 97.8 |
| 9 | 80 | 102.1 | 80 | 102.7 |
| 10 | 84.2 | 107 | 84.2 | 107.8 |
| 11 | 85 | 105.5 | 85 | 106.1 |
| 12 | 85 | 107.5 | 85 | 108.2 |
| 13 | 85 | 108.7 | 86 | 108.7 |
| 14 | 86.7 | 107.5 | 87.5 | 110 |
| 15 | 85 | 107.5 | 86.2 | 111.2 |
| 16 | 86.5 | 108 | 86.5 | 109 |
| 17 | 85 | 106.7 | 87.5 | 108.3 |
| 18 | 84.7 | 98.2 | 70 | 103 |
| 19 | 67.7 | 99 | 69 | 104 |
| 20 | 67.7 | 106.7 | 95.7 | 110.6 |
| 21 | 95 | 105 | 97 | 107.5 |
| 22 | 93.5 | 104.5 | 96 | 109 |
| 23 | 92.5 | 105.7 | 97.5 | 109.2 |
| 24 | 96 | 107.2 | 98.7 | 109.5 |
| 25 | 97.5 | 106.7 | 98.5 | 107.2 |
| 26 | 94 | 104.7 | 95.2 | 107.6 |
| 27 | 94 | 105.2 | 94.7 | 108 |
| 28 | 94.2 | 103.7 | 95 | 107.5 |
| 29 | 92.8 | 104.3 | 95 | 111.7 |
| 30 | 92.5 | 109.2 | 96.8 | 112.2 |
| 31 | 97.2 | 109.5 | 99.5 | 109.2 |
| 32 | 96.2 | 106 | 100.6 | 111.2 |
| 33 | 98.5 | 106.2 | 105 | 111.7 |
| 34 | 100 | 108.5 | 108.5 | 117 |
| 35 | 103.2 | 114.5 | 107.5 | |
| 36 | 105.5 | | | |

get more information
ok Russell

pretty good insight

high rate drop

normal

352E

Dubucum-type plate
Irons - New York
Crumpen & Co

These 2 cells are B4
& the center will get
considerable more pressure
than it should as
pocket is thicker than
Dubucum-type for which
die was made for

| | | | | |
|-----|-------|-------|-------|-------|
| 27 | 204.2 | 216 | 203.5 | 217.5 |
| 28 | 115 | 194.5 | 110 | 197.5 |
| 30 | 119 | 210 | 117.5 | 207.5 |
| 31 | 152.7 | 161 | 152.5 | 156.7 |
| 32 | 154.2 | 156 | 147.2 | 149.5 |
| 33 | 148.5 | 156.5 | 146.2 | 149.2 |
| 34 | 143.5 | 147.7 | 141 | 143.2 |
| 35 | 144 | 147.7 | 140.7 | 142.5 |
| 36 | 207 | 216 | 209 | 215 |
| 37 | 198 | 212 | 198.5 | 212.5 |
| 38 | 205 | 226.7 | 203.5 | 217.7 |
| 39 | 198 | 214.5 | 198.5 | 214 |
| 40 | 192.7 | 200.5 | 184 | 200 |
| 41 | 178.5 | 196 | 180 | 195 |
| 56 | 206.7 | 220 | 206.7 | 217 |
| 63 | 202 | 217.5 | 203 | 214 |
| 65 | 212.5 | 224.5 | 211.5 | 221.2 |
| 105 | 195 | 210.7 | 199 | 210.5 |
| 115 | 190 | 204 | 192 | 204 |

High road

130 fath

normal temp

normal

Longley

Amson and Co
Junk out of
Glebe Ch. 354
is really not here

253- OH No 4 die for know-
Fe 3011- high 210y-

| Run | 1/2 | 1/2 | 1/2 | 1/2 |
|-----|-------|-------|-------|-------|
| 3 | 165 | 178 | 161.5 | 177.5 |
| 4 | 168.5 | 184.5 | 166.5 | 185.7 |
| 5 | 170.5 | 186.7 | 170 | 186 |
| 6 | 153 | — | 147.5 | — |
| 7 | 160.5 | — | 157.5 | — |
| 8 | 162 | — | 161.2 | — |
| 9 | 156.5 | — | 155 | — |
| 10 | 182.5 | 208.5 | 185 | 208.5 |
| 11 | 185 | 259.5 | 190 | 259.5 |
| 12 | 187.2 | 203.5 | 188.2 | 201 |
| 13 | 197 | 208 | 196 | 207.2 |
| 14 | 194 | 206.2 | 194 | 206 |
| 15 | 198 | 211.7 | 200 | 213.5 |
| 16 | 192 | 205 | 192 | 205 |
| 17 | 198.7 | 210 | 198 | 210 |
| 18 | 200 | 210 | 200.5 | 211.5 |
| 19 | 198.7 | 210 | 198 | 210 |
| 21 | 206 | 217.7 | 206.7 | 220 |
| 22 | 200 | 210.7 | 201.7 | 213 |
| 23 | 206.5 | 216.2 | 206.5 | 217.5 |
| 24 | 201 | 211.5 | 201.2 | 214.7 |
| 25 | 203 | 215 | 203 | 216.5 |
| 26 | 205 | 217 | 205 | 215.5 |

12 hours

12 hours

V to 1/2 13

| | | | | |
|-----|-------|-------|-------|-------|
| 21 | 207 | 219 | 203.2 | 212.7 |
| 22 | 205 | 214 | 200 | 211 |
| 23 | 210 | 220 | 207.5 | 218.7 |
| 24 | 205 | 215.5 | 201.2 | 214.2 |
| 25 | 208.2 | 217.2 | 203. | 216 |
| 26 | 208 | 215.5 | 202.7 | 216.2 |
| 27 | 207.2 | 218.2 | 203.2 | 215 |
| 28 | 112 | 205 | 120 | 206 |
| 33 | 116.7 | 213.3 | 117.5 | 213.3 |
| 31 | 153.2 | 157.7 | 154.2 | 160 |
| 32 | 148.2 | 151 | 154.7 | 156.7 |
| 33 | 147.7 | 150.7 | 152.5 | 155.7 |
| 34 | 142 | 144.5 | 148 | 150.5 |
| 35 | 142.5 | 145 | 148 | 150 |
| 36 | 210 | 218.2 | 206.5 | 214 |
| 37 | 197.5 | 213.5 | 196.7 | 214 |
| 38 | 203 | 219.2 | 200 | 224 |
| 39 | 200 | 216 | 197.5 | 216.2 |
| 40 | 195 | 201.5 | 191.2 | 202 |
| 41 | 191.5 | 197.5 | 177.5 | 197.2 |
| 56 | 207 | 218.2 | 205.5 | 218.2 |
| 63 | 203.5 | 216.5 | 200 | 210 |
| 65 | 212.5 | 223.5 | 210 | 222 |
| 103 | 199 | 213 | 198.2 | 211.5 |
| 115 | 193.7 | 207.5 | 193.2 | 206.7 |

130 fwh

Normal temp

OK Cef of focus found OK -
354 - from mix 2109 find out

401, 3011 - mix 2109

Thank Mitchell here
Cody Lake
March 24

Reg Corrupted L.D.

Reg in every copy in

Check on 2.53 E

| | | | | |
|----|-------|-------|-------|-------|
| 3 | 172.5 | 183 | 170 | 181.2 |
| 4 | 181.5 | 193 | 174 | 190.5 |
| 5 | 179 | 192 | 175.2 | 190.5 |
| 6 | 160 | 157 | 165 | 163 |
| 7 | 167.5 | 165 | 163 | 162.5 |
| 8 | 165 | 167 | 162.5 | 160 |
| 9 | 167 | 165 | 162.5 | 160 |
| 10 | 192.5 | 209.5 | 187.5 | 205 |
| 11 | 195 | 209.7 | 190 | 207 |
| 12 | 191 | 202.5 | 186.5 | 202.5 |
| 13 | 197 | 208 | 194 | 207 |
| 14 | 195 | 207.5 | 192.5 | 205.5 |
| 15 | 201.5 | 214.2 | 196.2 | 211 |
| 16 | 195 | 208 | 191 | 207 |
| 17 | 200 | 211 | 197 | 209.6 |
| 18 | 202.7 | 210 | 194.2 | 212 |
| 19 | 201 | 211.5 | 196 | 206.5 |

7 Houchy

Long clips

355

| | | | | |
|----|-------|-------|-------|-------|
| 6 | 73 | 98.2 | 73 | 97.7 |
| 7 | 81.7 | 96.2 | 67.5 | 87.0 |
| 8 | 77.5 | 100 | 75.5 | 93.6 |
| 9 | 82.5 | 105 | 82.5 | 103.7 |
| 10 | 87.5 | 110 | 87.5 | 108.7 |
| 11 | 87 | 106.7 | 95.5 | 106. |
| 12 | 87.5 | 109 | 87.5 | 108 |
| 13 | 87.5 | 109 | 87.5 | 108.7 |
| 14 | 91.7 | 110.7 | 92.5 | 110 |
| 15 | 88.7 | 111.5 | 90 | 110.2 |
| 16 | 90 | 110 | 90.7 | 108.7 |
| 17 | 89.5 | 110 | 89 | 110 |
| 18 | 90.5 | 103 | 70 | 103.5 |
| 19 | 69 | 104.7 | 70 | 105 |
| 20 | 95.5 | 109.6 | 109.7 | 107.7 |
| 21 | 97 | 106.5 | 95.5 | 106.5 |
| 22 | 96 | 107 | 96.3 | 107 |
| 23 | 97.5 | 106.7 | 97.1 | 107 |
| 24 | 98.3 | 108.7 | 98.7 | 108 |
| 25 | 96.5 | 107.6 | 96.7 | 102.5 |
| 26 | 96.5 | 105.2 | 97 | 105.7 |
| 27 | 95.3 | 105.5 | 95.7 | 106.6 |
| 28 | 96.2 | 106.5 | 96.2 | 105.7 |
| 29 | 95.2 | 104.7 | 96 | 105.3 |
| 30 | 98.3 | 110 | 95.5 | 110 |
| 31 | 99.5 | 110.5 | 100 | 110.5 |
| 32 | 100.6 | 107.2 | 100.6 | 106.7 |
| 33 | 101.5 | 108 | 101.5 | 107.7 |
| 34 | 104.2 | 110 | 104.2 | 109 |

High rate dusty

Normal

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355-

2-B4 with rof all
die for processing visio-
Edge Crumpling

| | | | | |
|-----|-------|-------|-----|-------|
| 101 | 102.5 | 109.2 | 101 | 106.7 |
|-----|-------|-------|-----|-------|

356 E

~~Dung B4 1/2 plate
Cramped work. etc #14
Edge Cramped up
work 2 Nickels~~

| | |
|---|-------|
| 1 | 27.93 |
| 2 | 22.80 |
| 3 | 21.25 |
| 4 | 21.26 |
| 5 | 21.26 |
| 6 | 21.86 |
| 7 | 21.19 |

Co

90

| | | | | | |
|----|------|------|------|------|-----------------|
| 29 | 1425 | 1450 | 1550 | 1550 | 750 rals. |
| 30 | 1515 | 1547 | 1687 | 1700 | " |
| 31 | 1687 | 1687 | 1612 | 1725 | " |
| 32 | 2200 | 2225 | 2225 | 2215 | normal |
| 33 | 1915 | 1915 | 1945 | 1955 | |
| 34 | 1720 | 1700 | 1725 | 1730 | |
| 36 | 1162 | 1125 | 1250 | 1275 | Brushy Hyphrate |
| 38 | 1400 | 1387 | 1412 | 1475 | |
| 39 | 1920 | 1925 | 1925 | 1920 | normal |
| 40 | 1875 | 1865 | 1875 | 1865 | |
| 41 | 1735 | 1735 | 1840 | 1845 | |
| 42 | 1730 | 1790 | 1795 | 1790 | Hyphrate. |
| 43 | 1785 | 1795 | 1795 | 1795 | " |
| 45 | 1375 | 1400 | 1525 | 1527 | Cut out |

1890/1800

357E

~~1890/1800~~

Pockets. 0.105.

Grids from 015 stock processed at
5 ~~at~~ ~~the~~ ~~same~~ ~~place~~ ~~as~~ ~~the~~ ~~one~~ ~~with~~

cell. X & 2. done with bed of

which thin strips were fitted

Mix # 2953 - Crimped with set # 2

| | | | | |
|----|------|------|------|------|
| | V | 1/2 | | |
| 4 | 1685 | 1845 | 1665 | 1851 |
| 14 | 1550 | 1550 | 1625 | 1637 |
| 15 | 2190 | 2190 | 2195 | 2162 |
| 16 | 1985 | 1985 | 1995 | 1975 |
| 17 | 1820 | 1880 | 1875 | 1890 |
| 18 | 1775 | 1760 | 1775 | 1760 |
| 19 | 1690 | 1680 | 1655 | 1655 |
| 20 | 1187 | 1125 | 1237 | 1212 |
| 21 | 1475 | 1300 | 1537 | 150 |
| 22 | 1562 | 1412 | 1650 | 1587 |
| 23 | 1945 | 1890 | 1900 | 1890 |
| 24 | 1845 | 1890 | 1880 | 1850 |
| 25 | 1600 | 1550 | 1550 | 1590 |
| 26 | 1840 | 1835 | 1860 | 1865 |
| 27 | 1890 | 1880 | 1895 | 1890 |

750 rals.

" "

" "

" "

" "

" "

" "

| | V | 1/2 | V | 1/2 |
|-----|-------|-------|-------|-------|
| 17 | 193 | 199 | 191 | 196.5 |
| 19 | 191 | 195.5 | 190 | 199 |
| 20 | 95.7 | 201.5 | 126.7 | 202.5 |
| 21 | 126.7 | 201.5 | 126.7 | 200 |
| 22 | 128.2 | 201.5 | 126 | 200 |
| 23 | 120 | 205 | 120 | 200 |
| 24 | 116.7 | 201.7 | 116.7 | 201.7 |
| 25 | 123.3 | 203.3 | 118.3 | 201 |
| 26 | 116.7 | 201.7 | 108.3 | 201 |
| 27 | 123.3 | 205.5 | 120 | 201.5 |
| 28 | 111.7 | 202.5 | 111.7 | 204.2 |
| 29 | 111.7 | 205 | 106.7 | 204.2 |
| 30 | 109.2 | 203.3 | 108.3 | 204.2 |
| 31 | | | | |
| 32 | | | | |
| 33 | 108.3 | 204.2 | 110.7 | 204.2 |
| 34 | 101.7 | 197.5 | 96.7 | 197.5 |
| 35 | 90 | 183.3 | 83.3 | 178.3 |
| 36 | 65 | 175 | 57.5 | 170 |
| 114 | 60.7 | 131.7 | 54.2 | 115 |

High discharge
High discharge 100 any

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Set aside
358 1/2 Ls from closer
Lake with 20% Tin oxide
mixed with it 6% Hg
Muller = 2109 Exp -
2 Cells A4 made up
with #4 cell Crumpey
dis. Aug 8 green pencil

| | V | 1/2 | V | 1/2 | |
|----|-------|-------|-------|-------|-----------------|
| 1 | 195 | 197 | 196 | 199 | Note small def |
| 2 | 197.2 | 204 | 200 | 204.2 | bottom Volt 1/2 |
| 3 | 181.5 | 184.5 | 186 | 188 | |
| 4 | 171.5 | 179.5 | 179 | 182.7 | |
| 5 | 157.5 | 190 | 187 | 189.7 | V to X 2 1/2 |
| 6 | 157.2 | 188 | 185 | 187.2 | |
| 7 | 182.7 | 188 | 182.5 | 185.2 | |
| 8 | 148 | 148.5 | 158 | 160.7 | - at 130° Fahr |
| 9 | 158.7 | 160.5 | 161.5 | 164.5 | " |
| 10 | 173 | 197 | 192.2 | 196 | Normal |
| 11 | 191.5 | 198 | 191 | 197.5 | |
| 12 | 182.7 | 187.7 | 182 | 186.5 | |
| 13 | 188.7 | 195 | 182 | 187.5 | |
| 14 | 187.5 | 193.5 | 187 | 192.7 | |
| 15 | 188.2 | 196.7 | 187.5 | 195 | |

| | Y | $\frac{1}{2}$ | Y | $\frac{1}{2}$ |
|-----|-------|---------------|-------|---------------|
| 25 | 260 | 220 | 198 | 210.5 |
| 27 | 190 | 207 | 188 | 205.5 |
| 28 | 193 | 211 | 190.5 | 206 |
| 30 | 195 | 202.5 | 190 | 204.5 |
| 31 | 200 | 213.7 | 198.7 | 211.7 |
| 32 | 201.2 | 214.5 | 197.7 | 211.2 |
| 33 | 199.7 | 214.2 | 197 | 208 |
| 34 | 195.5 | 209.5 | 194 | 206 |
| 35 | 196 | 210 | 195 | 206.2 |
| 36 | 190 | 203.5 | 188 | 201.5 |
| 37 | 199.5 | 212.7 | 198.2 | 207.7 |
| 38 | 201.2 | 214.7 | 199 | 210.5 |
| 39 | 196.5 | 210 | 193.2 | 205.2 |
| 40 | 166 | 174.5 | 165.2 | 173 |
| 41 | 161.7 | 165.7 | 159.5 | 163.7 |
| 54 | 75 | 191.5 | 75 | 130.8 |
| 65 | 200 | 217.5 | 195 | 208.5 |
| 100 | 192.5 | 218 | 190 | 207 |

Chp 30 how

15 "

12 "

" "

" "

" "

7 hours

" "

" "

11

-130 fah

"

200 1/2 High rate

Normal

72

359E

Negative plates Regular photo A4 cells
+ Corrugated for Comparison with
360 + 361

| | Y | $\frac{1}{2}$ | Y | $\frac{1}{2}$ |
|----|-------|---------------|-------|---------------|
| 1 | 212.5 | 221 | 212 | 220 |
| 2 | 178 | 189 | 178 | 189 |
| 3 | 167 | 183 | 167 | 183 |
| 4 | 165 | 192 | 166 | 193 |
| 5 | 167 | 186 | 167 | 183 |
| 6 | 153 | — | 153 | — |
| 7 | 156 | — | 156 | — |
| 8 | 158 | — | 158 | — |
| 9 | 160 | 186 | 157 | 184 |
| 10 | 185 | 207 | — | — |
| 11 | 180 | 207 | 180 | 205 |
| 12 | 180 | 205 | 180 | 203 |
| 13 | 180 | 202.2 | 180 | 198 |
| 14 | 200 | 216.2 | 198 | 213 |
| 15 | 183 | 203 | 190 | 205 |
| 16 | 193 | 209.5 | 193.5 | 208.2 |
| 17 | 200 | 215 | 197.7 | 213 |
| 18 | 200 | 208 | 198.7 | 207.5 |
| 19 | 196.2 | 207.5 | 195 | 204.5 |
| 20 | 200 | 213.2 | 195 | 205.5 |
| 21 | 200 | 213.5 | 198.2 | 210 |
| 22 | 201.5 | 215 | 201.5 | 212.2 |
| 23 | 201.5 | 216.2 | 201.5 | 212 |

long change

V + $\frac{1}{2}$ - 20.5H

| | ✓ | 1/2 | ✓ | 1/2 |
|-----|-------|-------|--------|----------------------|
| 25 | 195 | 210.5 | 197.7 | 215 |
| 27 | 190 | 201.2 | 188.5 | 205 |
| 29 | 189 | 202 | 192 | 206.5 |
| 30 | 193 | 201 | 192.5 | 205 |
| 31 | 196.7 | 205 | 198.7 | 211 |
| 32 | 197.2 | 207 | 200 | 211.5 |
| 33 | 196 | 206.7 | 197.15 | 210 |
| 34 | 193.7 | 203.7 | 195 | 206 |
| 35 | 193 | 203 | 195 | 206 |
| 36 | 186.2 | 197.5 | 187.15 | 201.7 |
| 37 | 196.5 | 205 | 198.2 | 209.2 |
| 38 | 198.5 | 208.5 | 199.5 | 211.2 |
| 39 | 193 | 203.5 | 195 | 207.2 |
| 40 | 165 | 171.2 | 166.7 | 172 130 faler |
| 41 | 156.2 | 162 | 156.7 | 162.5 " |
| 54 | 78.3 | 92.1 | 83.2 | 100.5 20 1/2 thymine |
| 65 | 195 | 212 | 195 | 214.5 normal |
| 100 | 188.7 | 203.7 | 191.2 | 201.5 |

360 E Neg plates A 4 processed in
 dev. like #4 8 gram basket.

30 hours

15 "

12 "

" "

" "

7 hours

" "

" "

| | ✓ | 1/2 | ✓ | 1/2 |
|----|-------|-------|-------|--------------|
| 1 | 212 | 222 | 217 | 224 |
| 2 | 178 | 188 | 178 | 190 |
| 3 | 168 | 181 | 168 | 184 |
| 4 | 167 | 190 | 167 | 193 |
| 5 | 167 | 181 | 167 | 184 |
| 6 | 153 | — | 153 | — |
| 7 | 154 | — | 154 | — |
| 8 | 157 | — | 157 | — |
| 9 | 158 | 183 | 160 | 185 |
| 10 | 180 | 205 | 185 | 207 Long chg |
| 11 | 180 | 205 | 181 | 207 |
| 12 | 180 | 205 | 180 | 204 |
| 13 | 175 | 198 | 175 | 201 |
| 14 | 175 | 212.2 | 208 | 215.5 |
| 15 | 190 | 207 | 193 | 211 |
| 16 | 193 | 205 | 193.7 | 209 |
| 17 | 196 | 211.5 | 200 | 213.7 |
| 18 | 195 | 204.7 | 195.7 | 207.7 |
| 19 | 190 | 204 | 195 | 207.7 |
| 20 | 195 | 207.5 | 200 | 211.2 |
| 21 | 195.7 | 205 | 200 | 211.5 |
| 22 | 193.7 | 201.5 | 197.2 | 212.2 |
| 23 | 200 | 206.5 | 200.7 | 215 |

Long chg

20 1/2 23

Use 115 Almas on single pockets
area of Ram 5.95 square inches

10 sec less approx

| | | | | |
|------------------|-------|-------|-------|-------|
| 25 | 200 | 215.5 | 203.5 | 219 |
| 27 | 195 | 207 | 195 | 209.5 |
| 27 ²⁵ | 195 | 208.5 | 196.5 | 214.5 |
| 29 | 195 | 207.5 | 199 | 209.5 |
| 30 | 202.7 | 216.2 | 205.2 | 219.2 |
| 31 | 201.2 | 214.5 | 203.2 | 219.5 |
| 32 | 200 | 214.7 | 201 | 213.2 |
| 33 | 197.7 | 208.5 | 198.5 | 209.7 |
| 34 | 196 | 207 | 196.5 | 210 |
| 35 | 198 | 207 | 191.5 | 204.5 |
| 36 | 199.2 | 212.2 | 200 | 214.7 |
| 37 | 200.5 | 212.7 | 203 | 217 |
| 38 | 195 | 208.2 | 196.7 | 210.7 |
| 39 | 158.7 | 163.5 | 159 | 164 |
| 40 | 161.7 | 165.7 | 159.5 | 163.7 |
| 41 | 76.7 | 75 | 75 | 75 |
| 54 | 195 | 215 | 200 | 218 |
| 65 | 190 | 208.2 | 191 | 209.2 |
| 100 | | | | |

30 hours

15 "

12 "

"

"

7 hours

"

"

"

13a Tabul

"

High rate

1000

361E A4 neg plate pressed in
due like 4 7 from pocket

✓ 1/2 ✓ 1/2

| | | | | |
|----|-------|-------|-------|-------|
| 1 | 202 | 213 | 205 | 218 |
| 2 | 192 | 199 | 192 | 202 |
| 3 | 177 | 186 | 177 | 186 |
| 4 | 177 | 187 | 178 | 187 |
| 5 | 173 | 177 | 173 | 177 |
| 6 | 165 | 164 | — | — |
| 7 | 165 | 165 | — | — |
| 8 | 173 | 184 | 173 | 185 |
| 9 | 185 | 197 | 183 | 198 |
| 10 | 185 | 201 | 187 | 206 |
| 11 | 185 | 201 | 190 | 203.5 |
| 12 | 185 | 201.5 | 189 | 204 |
| 13 | 190 | 200 | 190 | 202.2 |
| 14 | 195 | 205 | 195 | 211.2 |
| 15 | 193 | 204.5 | 194.2 | 206.2 |
| 16 | 192 | 203.2 | 192.7 | 206 |
| 17 | 197 | 208.5 | 198.5 | 212.2 |
| 18 | 192.5 | 203.7 | 194 | 206 |
| 19 | 182.7 | 192.2 | 183.5 | 193.7 |
| 20 | 205.5 | 216.5 | 207.7 | 218 |
| 21 | 199.5 | 211 | 202.7 | 213.2 |
| 22 | 195 | 206.5 | 195.7 | 209.2 |

Va 1/2 13 @ 15

Ram 12' Dia - 120 Tons on gauge
in making A4 $\frac{7}{8}$ plate.

The crimp part outside of 24
pockets is 10.5 inches -
11.4 Tons per square inch

On A4 will put 160 Tons
on B4 80 Tons -

Ott 333-4-5 only had equivalent
of 120 Tons

362f

2 Reg run 72 y approx.
 pocket made with #4 at C dis.
 smooth power after coast

to 6E run 1st 5 Run hot
 at 130 Fahr & then normal

| | Y | Y | Y | Y |
|----|------|------|-----------------|-----------|
| 1 | 2467 | 2720 | 130 Fahr | |
| | 1513 | 1500 | at 35° deg Fahr | |
| 2 | 2613 | 2753 | 130 Fahr | |
| 3 | 113 | 120 | 35° Fahr | |
| 3 | 2380 | 2693 | | Hot |
| 4 | 2460 | 2803 | | 130 Fahr |
| 5 | 2497 | 2920 | 130 Fahr | |
| 6 | 2040 | 2100 | normal | |
| 7 | 2003 | 1993 | | |
| 8 | 2013 | 2087 | | |
| 10 | 1375 | 1500 | 2000 deg | high temp |
| 12 | 2380 | 2387 | normal | |
| 13 | 2347 | 2367 | " | |
| 14 | 2427 | 2533 | " | |
| 15 | 2400 | 2453 | " | |
| 16 | 2320 | 2353 | " | |
| 17 | 1812 | 1937 | high temp | |
| 18 | 1862 | 1937 | " | |
| 19 | 1750 | 1962 | " | |

2 Cells

363 E

Same as 362 E

But 1st 5 Runs are to 62.
run Cal'd 35° before & then

Normal

| | V | V | |
|----|------|------|-----------------------|
| 3 | 913 | 1447 | 35° day |
| 4 | 907 | 1413 | " |
| 5 | 933 | 1467 | " |
| 6 | 2267 | 2533 | Normal |
| 7 | 2000 | 2267 | |
| 8 | 1860 | 2133 | |
| 10 | 1162 | 1412 | Quadruply Superheated |
| 12 | 2073 | 2250 | Normal |
| 13 | 2093 | 2253 | " |
| 14 | 1993 | 2233 | " |
| 15 | 2087 | 2187 | " |
| 16 | 1980 | 2107 | " |
| 17 | 1325 | 1684 | Highwater |
| 18 | 1362 | 1613 | |
| 19 | 1362 | 1662 | |

364-

Dup of 362

Red formed normal 3 Run
& whole face of packet

Cut away & then

Run normal & also

Hat,

Where is run

Of the 3 ways of forming 362-363+365-
the last 365 seems to be the best
high density rate

Something in this way
of forming cells S.S.
Dry A4 - New #4 die

Aint 365
get focus packet
cut away

93 | 2227 | 2387

365 E same as 362 E

But 1st 5 Runs to be set

Good rate at their new normal

| | V | .8 | 1V | .8 | |
|----|------|------|------|------|-------------------|
| 1 | 1760 | 2213 | 1600 | 2013 | Normal |
| 2 | 1573 | 2053 | 1573 | 2026 | 800 Rate |
| 3 | 1534 | 2040 | 1560 | 2026 | " |
| 4 | 1600 | 2119 | 1600 | 2119 | " |
| 5 | 1600 | 2066 | 1600 | 2066 | " normal |
| 6 | 2160 | 2133 | | | normal |
| 7 | 2093 | | 2007 | | " |
| 8 | 2113 | | 1987 | | " |
| 10 | 1462 | | 1556 | | Density high rate |
| 12 | 2400 | | 2367 | | normal |
| 13 | 2267 | | 2247 | | " |
| 14 | 2433 | | 2367 | | " |
| 15 | 2393 | | 2333 | | " |
| 16 | 2353 | | 2267 | | " |
| 17 | 1812 | | 1812 | | High rate |
| 18 | 1862 | | 1862 | | " |
| 19 | 1825 | | 1837 | | " |
| 20 | | | | | |
| 21 | 2453 | | 2287 | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | 2507 | | 2373 | | normal |
| 40 | 2487 | | 2287 | | High rate |
| 51 | 1945 | | 1962 | | |

| | a | | 3 Cells | | c | | |
|----|-------|-------|---------|-------|-------|-------|---------------|
| 1 | 225 | 231 | 225.5 | 233.5 | 225 | 232 | Normal |
| 2 | 175 | 178.5 | 175.5 | 177.5 | 154 | 157 | |
| 3 | 165 | 184 | 165 | 172 | 136.5 | 138.5 | |
| 4 | 158.5 | 182.5 | 164 | 179 | 148.5 | 156 | 130 lbs. C.H. |
| 5 | 171.5 | 196.5 | 172 | 191 | 178 | 201.5 | Normal |
| 6 | 172.5 | 195.5 | 170 | 192 | 167.5 | 198 | |
| 7 | 186.7 | 210 | 183.7 | 206.7 | 178.5 | 211.2 | |
| 8 | 180 | 196.7 | 180 | 196 | 173.7 | 200.5 | |
| 9 | 181 | 199 | 185 | 200.7 | 178.5 | 206.5 | |
| 10 | 184 | 200 | 195 | 200 | 180 | 205 | |
| 11 | 184 | 209.5 | 194.2 | 210.5 | 189 | 212.5 | |
| 12 | 193.5 | 209.5 | 195 | 209 | 190 | 216 | |
| 13 | 195 | 208 | 192 | 209 | 185 | 215 | |
| 14 | 192 | 205 | 192 | 205 | 185 | 210 | |
| 15 | 190 | 190 | 193 | 205 | 197 | 212 | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | 225 | 231 | 225 | 234 | 226.5 | 235 | Normal |
| 19 | 156 | 157 | 70 | 113 | 70 | 114 | |
| 20 | 130 | 135.5 | 73.5 | 136 | | | |
| 21 | 125.5 | 127.5 | 31 | 78 | 30 | 54.2 | 30° Fahr |
| 22 | 180 | 200.5 | 172.2 | 197.5 | 175 | 197 | Normal |
| 23 | 170 | 196.5 | 167.5 | 185 | 167.5 | 186.5 | " |
| 24 | 180 | 208.5 | 181.5 | 197.2 | 180 | 197.5 | " |
| 25 | 177.5 | 200 | 178 | 195.2 | 178.5 | 191.5 | " |
| 26 | 179 | 203.7 | 183.5 | 195.5 | 183.5 | 197.7 | " |
| 27 | 180 | 202 | 184 | 195 | 185 | 197.5 | " |
| 28 | 190 | 213.7 | 196 | 206.2 | 192.7 | 207.7 | " |
| 29 | 191 | 212 | 198 | 204 | 188 | 205 | " |
| 30 | 168 | 211 | 191 | 204 | 187 | 205 | " |
| 31 | 143 | 208 | 191 | 201 | 192 | 202 | " |
| 32 | 181 | 207 | 190 | 201 | 191 | 198 | " |

366F

6 A4 Cells 7 gram packets -
pressure 160 tons. Press Crimping
die cell #4 - afterwards pressure
with Cat die 120 tons -
Cells dissolved to distribute stress

| | V | 1/2 | 1/2 | 1/2 | |
|---|-----|-------|-------|-------|--------------|
| 1 | 225 | 231 | 225.5 | 235.5 | Normal |
| 2 | 175 | 178.5 | 178.5 | 177.5 | Normal |
| 3 | 154 | 157 | 156 | 159 | at 130° Fahr |
| 4 | 70 | 115 | 70 | 114 | at 35° " |

1st 2 Run Normal on 2nd Run
2nd 2 Two run 130° Fahr
3rd Two at 35° Fahr

A

det

367

A

B

3 867 977 887 987 Korral

367-1

6 B4 Cells 5.3 gm Packets -
Pressure 80 Ton GOC #1 die
Information. Get die 60 Ton
Cells according to schedule
Lithia -

Occ further EN

368E

Short tubes 2 cells soaked
24 hours in Congo LiOH,
then put in 21K2 Li & put right
onaly Run Reg

~~These~~ vials used in these cells
Nuclei need die off # of y years

| | | |
|------------------|------|------|
| 1 | 1010 | 1033 |
| 2 | 1193 | 1207 |
| 3 | 1200 | 1210 |
| 4 | 1223 | 1233 |
| 5 | 1267 | 1273 |
| 6 | 1267 | 1273 |
| 7 | 1290 | 1300 |
| 8 | 1340 | 1343 |
| 10 | 1343 | 1347 |
| 11 | 1353 | 1357 |
| 12 | 1373 | 1380 |
| 13 | 1390 | 1390 |
| 14 | 1400 | 1400 |
| 15 | 1400 | 1400 |
| 16 | 1390 | 1390 |
| 27 | 1450 | 1500 |
| 100 ⁿ | 1267 | 1263 |
| 125 | 1267 | 1233 |

Nothing in it,

HotC-p 660-697
100 # at run Hot 673 587

370 E

7 Cells no marked plating
on any part of chloroplasts

| | V | $\frac{1}{2}$ | V | $\frac{1}{2}$ | V | 7 hour |
|-----|-----|---------------|-----|---------------|-----|--------|
| 9 | 172 | 177 | 170 | 175 | 159 | 158 |
| 24 | 176 | 182 | 175 | 184 | 156 | 151 |
| 39 | 181 | 191 | 178 | 186 | 159 | 156 |
| 67 | 156 | 180 | 170 | 180 | 135 | 152 |
| 120 | 175 | 185 | 170 | 180 | 153 | 144 |
| 245 | 148 | 166 | | | | |
| 2 | | | | | | |

Don't appear to be
good -

| | V | .9V | V | .9V | V | .9V |
|----|------|------|------|------|------|------|
| 40 | 92.5 | 95.8 | 93 | 87.5 | 89.5 | 92.5 |
| 40 | 90.7 | 94 | 81.2 | 84 | 88.7 | 92 |
| 51 | 90 | 93.2 | 80 | 82.5 | 86.2 | 900 |
| 92 | 88 | 89.7 | 80 | 82.5 | 83.5 | 86 |

341- Set aside
B4 Burnwith Cells Hatched (n...)

| | V | 1/2 | V | 1/2 | V | 1/2 |
|----|------|------|------|------|------|------|
| 1 | 84 | 84.7 | 84 | 87 | 83 | 86.1 |
| 2 | 85 | 84.2 | 81.2 | 93.8 | 80 | 92.7 |
| 3 | 85 | 93 | 81.2 | 89 | 78.7 | 87.5 |
| 5 | 88.2 | 94 | 84.5 | 90.5 | 81.6 | 89.2 |
| 6 | 90 | 97.5 | 84.2 | 90.8 | 82.5 | 91.2 |
| 7 | 90 | 98.8 | 90 | 94.5 | 86.5 | 91.7 |
| 8 | 82.5 | 92.5 | 88.5 | 94.5 | 75.5 | 88.1 |
| 9 | 79 | 84.5 | 80 | 88 | 72.5 | 81 |
| 10 | 80.3 | 81.5 | 65 | 74.7 | 72.5 | 80.3 |
| 11 | 81.5 | 96.5 | 72.5 | 84 | 76.2 | 83.2 |
| 12 | 75.8 | 81 | 64 | 68 | 69.3 | 77.8 |
| 14 | 80.3 | 84.5 | 72.5 | 77.7 | 74.3 | 80 |
| 15 | 85 | 92.1 | 77.7 | 82.5 | 80 | 91.0 |
| 16 | 85.2 | 89.7 | 75 | 80.7 | 82.5 | 86.7 |
| 17 | 89 | 95.2 | 82.5 | 87 | 84.1 | 90 |
| 19 | 85 | 89 | 75 | 82 | 79.5 | 85.5 |
| 19 | 85.5 | 91.7 | 71.2 | 79 | 78.5 | 89 |
| 20 | 84.7 | 89.2 | 75.0 | 81.7 | 81.7 | 87 |
| 21 | 83.7 | 86.7 | 73.7 | 79.8 | 80 | 86.2 |
| 22 | 84.5 | 89 | 76.2 | 80 | 81.2 | 86.4 |
| 23 | 87.5 | 93 | 77.5 | 83.7 | 85 | 89.6 |
| 24 | 85 | 90 | 76.5 | 82.5 | 82.5 | 87.5 |
| 25 | 86.2 | 90.7 | 80 | 84.2 | 84.2 | 89 |

Note 9V

333X Sing B von plate

333X pressed in die like #66 4

334X 1st with Converse die, then #4 all

335X " 6H4 then with flat die

336X " 6H4 - then with deep Converse die

333X

High rate die set

| | | | | | | | | |
|----|-------|-------|----|-------|-------|--------|-------|------|
| 3 | 24.14 | 24.37 | 12 | 20 | 36.25 | 20 | 37.15 | |
| 4 | 24.06 | 26.17 | 14 | 25.50 | 40.45 | 25.45 | 46.5 | norm |
| 5 | 24.38 | 26.65 | 15 | 32.50 | 33.00 | | | |
| 6 | 23.63 | 25.61 | 16 | 30.86 | 33.20 | normal | | |
| 7 | 24.37 | 26.80 | 17 | 31.25 | 33.55 | normal | | |
| 8 | 25.61 | 28.22 | 18 | 30.62 | 33.33 | " | | |
| 9 | 25.01 | 26.97 | 19 | 30.00 | 32.61 | | | |
| 10 | 25.0 | 25.13 | 20 | 28.24 | 30.7 | | | |
| 11 | 25.61 | 26.65 | 21 | 29.64 | 31.69 | | | |
| 12 | 25.61 | 26.65 | 45 | 30.64 | 31.21 | | | |
| 13 | 25.61 | 26.65 | 80 | 29.65 | 30.72 | | | |

334X

High rate die set

| | | | | | | | | |
|----|-------|-------|----|-------|-------|--------|-------|------|
| 3 | 23.01 | 22.58 | 12 | 15.38 | 27.38 | 17.51 | 30.80 | High |
| 4 | 22.01 | 22.20 | 14 | 18.75 | 31.75 | 24.44 | 30.50 | norm |
| 5 | 22.50 | 22.61 | 15 | 27.50 | 30.25 | | | |
| 6 | 21.26 | 22.50 | 16 | 26.25 | 28.76 | normal | | |
| 7 | 21.25 | 22.50 | 17 | 26.87 | 29.40 | normal | | |
| 8 | 21.25 | 22.50 | 18 | 23.02 | 25.75 | " | | |
| 9 | 21.26 | 23.57 | 19 | 21.66 | 25.21 | | | |
| 10 | 19.05 | 23.74 | 20 | 22.55 | 25.19 | | | |
| 11 | 16.95 | 23.50 | 21 | 24.80 | 27.47 | | | |
| 12 | 21.26 | 23.14 | 45 | 25.57 | 28.47 | | | |
| 13 | | | 80 | 26.57 | 27.61 | | | |
| 14 | | | 29 | | 32 | | | |

find out what
these are

Evidently no

improvement over
Rec of dia-Compassing

335X

High rate develop

| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-------|-------|-------|-------|-------|-------|--------|---|----|----|----|
| 2367 | 22.95 | 12 | 22.45 | 37.06 | 22.5 | 37.75 | | | | |
| 25.92 | 25.45 | 14 | 26.74 | 40.67 | 26.25 | 41.50 | | | | |
| 5 | 26.57 | 25.95 | 15 | 33.00 | 32.50 | | | | | |
| 6 | 25.75 | 25.01 | 16 | 32.45 | 32.51 | normal | | | | |
| 7 | 26.70 | 25.62 | 17 | 33.35 | 32.27 | " | | | | |
| 8 | 27.70 | 27.02 | 18 | 33.35 | 31.90 | " | | | | |
| 9 | 26.63 | 26.63 | 19 | 31.69 | 31.17 | | | | | |
| 10 | 27.4 | 27.11 | 20 | 29.84 | 29.86 | | | | | |
| 11 | 27.00 | 27.00 | 21 | 31.08 | 30.57 | | | | | |
| 12 | 22.45 | 27.00 | 45 | 30.64 | 31.07 | | | | | |
| | | | 80 | 30.26 | 30.44 | | | | | |
| | | | 96 | 32.69 | 32.57 | | | | | |

336X

High rate develop

| | V | 1/2 | V | 1/2 | NO 12 | | |
|----|-------|-------|----|-------|-------|------|--------|
| 3 | 22.95 | 20.44 | 20 | 36.25 | 20 | 37.5 | NO 12 |
| 4 | 25.47 | 22.20 | 15 | 37.05 | 25.01 | 37.5 | normal |
| 5 | 25.95 | 23.44 | 15 | 31.67 | | | |
| 6 | 25.01 | 22.50 | 16 | 30.91 | 30.40 | | |
| 7 | 25.62 | 22.80 | 17 | 31.25 | 30.42 | | |
| 8 | 27.02 | 24.38 | 18 | 30.42 | 29.95 | | |
| 9 | 25.61 | 24.35 | 20 | 29.19 | 29.01 | | |
| 10 | 24.77 | 23.67 | 21 | 29.49 | 29.36 | | |
| 11 | 26.57 | 24.75 | 45 | 30.77 | 30.00 | | |
| 12 | | | 96 | 32.7 | 31.61 | | |

From 372 to 377 - green put in the
various Cone 46 - all anhydrous
salt, soaked 2 days then dried
off, removing all liquid could
off - then dried & put them 30
mesh - The idea is to prevent
Crushing too much of the green
& getting lower loading -
it might be more porous.

372E Reg green soaked Cone KCl
left in - to backup at low loading
lot - two before assembling soaked
in water for 48 hours of thereabouts
then taken out & anhydrous

21 K2Si

| | | | | | |
|---|------|------|----|------|------|
| 1 | 667 | 640 | 10 | 1093 | 1097 |
| 2 | 833 | 807 | 11 | 1100 | 1120 |
| 3 | 893 | 900 | 12 | 1100 | 1117 |
| 4 | 987 | 960 | 13 | 1147 | 1150 |
| 5 | | | 14 | 1123 | 1167 |
| 6 | 1003 | 973 | 15 | 1130 | 1167 |
| 7 | 1007 | 983 | 17 | 1137 | 1167 |
| 8 | 1020 | 1027 | 33 | 1216 | 1250 |
| 9 | 1013 | 1070 | 40 | 1237 | 1240 |
| | | | 43 | 1210 | 1240 |

Loading lot

7.56 7.64

373E Reg green soaked

KCl rate

| | | | | | |
|----|------|------|----|------|------|
| 1 | 827 | 757 | 15 | 1247 | 1210 |
| 2 | 1007 | 907 | 17 | 1320 | 1233 |
| 3 | 1073 | 967 | 33 | 1350 | 1250 |
| 5 | 1150 | 1047 | 43 | 1300 | 1207 |
| 6 | 1157 | 1043 | 44 | 1025 | 1273 |
| 7 | 1173 | | | | |
| 8 | 1190 | 1107 | | | |
| 9 | 1220 | 1137 | | | |
| 10 | 1247 | 1160 | | | |
| 11 | 1260 | 1177 | | | |
| 12 | 1260 | 1173 | | | |
| 13 | 1307 | 1277 | | | |
| 14 | 1290 | 1203 | | | |

Loading lot

7.64 7.67

374 E Req Green soaked K Nitrate

| | | | | | Weight | |
|----|------|------|----|------|-------------|--|
| | | | | | 7.555 7.550 | |
| 1 | 783 | 550 | 13 | 1217 | 1067 | |
| 2 | 950 | 719 | 14 | 1260 | 1057 | |
| 3 | 1067 | 810 | 15 | 1273 | 1067 | |
| 5 | 1100 | 900 | 17 | 1283 | 1090 | |
| 6 | 1117 | 913 | 33 | 1333 | 1190 | |
| 7 | 1127 | 933 | 40 | 1307 | 1187 | |
| 8 | 1147 | 953 | 44 | 1313 | 1210 | |
| 9 | 1190 | 960 | | | | |
| 10 | 1210 | 1013 | | | | |
| 11 | 1223 | 1030 | | | | |
| 12 | 1227 | 1030 | | | | |

175 E Req Green soaked K Sulphate

| | | | | | L + Wt | |
|----|------|------|----|------|-------------|--|
| | | | | | 7.716 7.726 | |
| 1 | 553 | 560 | 15 | 1200 | 1065 | |
| 2 | 807 | 720 | 17 | 1230 | 1090 | |
| 3 | 927 | 807 | 33 | 1287 | 1160 | |
| 5 | 1040 | 890 | 40 | 1273 | 1287 | |
| 6 | 1063 | 907 | 44 | 1290 | 1177 | |
| 7 | 1080 | 923 | | | | |
| 8 | 1103 | 947 | | | | |
| 9 | 1133 | 963 | | | | |
| 10 | 1167 | 1017 | | | | |
| 11 | 1167 | 1017 | | | | |
| 12 | 1153 | 1023 | | | | |
| 13 | 1210 | 1057 | | | | |
| 14 | 1193 | 1053 | | | | |

Evidently the ~~freshwater~~ ~~mg~~ ~~frank~~
with the ~~sexual~~ ~~substance~~

372 to 377 - neither improve or
go bad, in fact do nothing

376 Reg. Ni green ~~detached~~ R Brounche

| | | | | | |
|----|------|------|----|------|------|
| 1 | 690 | 697 | 13 | 1230 | 1267 |
| 2 | 873 | 890 | 14 | 1213 | 1247 |
| 3 | 943 | 967 | 15 | 1217 | 1250 |
| 5 | 1037 | 1073 | 17 | 1253 | 1280 |
| 6 | 1053 | 1090 | 33 | 1300 | 1323 |
| 7 | 1067 | 1100 | 40 | 1277 | 1277 |
| 8 | 1093 | 1130 | 47 | 1280 | 1290 |
| 9 | 1127 | 1160 | | | |
| 10 | 1153 | 1193 | | | |
| 11 | 1160 | 1210 | | | |
| 12 | 1157 | 127 | | | |

Net
7.775
7.790

377 E Reg. Ni green ~~detached~~ R Brounche

| | | | | | |
|----|------|------|----|------|------|
| 1 | 873 | 890 | 15 | 1293 | 1310 |
| 2 | 950 | 960 | 17 | 1327 | 1350 |
| 3 | 980 | 987 | 33 | 1307 | 1290 |
| 5 | 1017 | 1023 | 44 | 1257 | 1267 |
| 6 | 1033 | 1043 | | | |
| 7 | 1047 | 1033 | | | |
| 8 | 1087 | 1100 | | | |
| 9 | 1127 | 1140 | | | |
| 10 | 1140 | 1183 | | | |
| 11 | 1207 | 1217 | | | |
| 12 | 1233 | 1247 | | | |
| 13 | 1293 | 1313 | | | |
| 14 | 1277 | 1293 | | | |

Net
7.593
7.562

378

| | | |
|----|------|------|
| 14 | | |
| 15 | | |
| 16 | 2107 | 1937 |
| 17 | | |
| 18 | 2180 | 2100 |
| 19 | 2167 | 2100 |
| 35 | 1950 | 2193 |
| 46 | 1250 | 1962 |
| 88 | 2067 | 2047 |
| 96 | 1767 | 1713 |

Hypervent
Normal

379

| | | |
|----|------|------|
| 14 | | |
| 15 | | |
| 16 | 2247 | 2127 |
| 17 | | |
| 18 | 2450 | 2257 |
| 19 | 2473 | 2300 |
| 35 | 2487 | 2367 |
| 46 | 1962 | 1775 |
| 88 | 2393 | 2362 |
| 96 | 2107 | 2093 |

Hypervent
Normal378E 7 gram phos 2 at
30000000. Check on dien

| | | |
|----|------|------|
| 1 | 2353 | 2353 |
| 2 | 1700 | 1650 |
| 4 | 925 | 912 |
| 5 | 1050 | 1037 |
| 6 | 1050 | 1037 |
| 7 | 1867 | 1833 |
| 8 | 1840 | 1800 |
| 10 | 1920 | 1833 |
| 11 | 1873 | 1833 |
| 12 | 1325 | 1187 |
| 13 | 1350 | 1225 |

Hypervent
Normal

Hypervent

379E 7 gram phos 2 at 200
atmos.

| | | |
|----|------|------|
| 1 | 2427 | 2380 |
| 2 | 1867 | 1855 |
| 4 | 1000 | 1000 |
| 5 | 1087 | 1250 |
| 6 | 1125 | 1125 |
| 7 | 2000 | 1940 |
| 8 | 1987 | 1900 |
| 10 | 2113 | 2000 |
| 11 | 2120 | 1993 |
| 12 | 1525 | 1437 |
| 13 | 1625 | 1477 |

Hypervent

Normal

Hypervent

| | | |
|----|------|------|
| 14 | | |
| 15 | | |
| 16 | 2340 | 2253 |
| 17 | | |
| 18 | 2520 | 2400 |
| 19 | 2480 | 2380 |
| 30 | 2500 | 2233 |
| 46 | 1675 | 1712 |
| 84 | 2400 | 2347 |
| 96 | 2187 | 2000 |

Normal

High rate:
Normal

Leptid prism
best
Capacity +
high development

25
2400
20
2

380E 7 gram photo 2 at
125 at 1000

| | | |
|----|------|------|
| 1 | 2520 | 2433 |
| 2 | 1967 | 1947 |
| 4 | 1250 | 1162 |
| 5 | 1312 | 1175 |
| 4 | 1150 | 1225 |
| 7 | 2240 | 2200 |
| 8 | 2200 | 2087 |
| 10 | 2253 | 2193 |
| 11 | 2213 | 2167 |
| 12 | 1687 | 1525 |
| 13 | 1750 | 1625 |

High rate capacity

Normal

"

"

High rate

22
2400
17

381 E 2 A4 - 7th plus 6 extra
 ground off same as ticks 11.00
 to 68 run size 11.00 at 750 rate
 per 7th packet -

| | | | | |
|-----|-----|-----|-----|-----|
| 101 | 159 | 217 | 153 | 210 |
| 107 | 160 | 212 | 152 | 207 |

750000 per packet

382 E

Reg Cells to a Rec'd 381 E

| | | | | |
|-----|-----|-----|-------|-----|
| 101 | 155 | 208 | 154.5 | 205 |
| 107 | 159 | 207 | 145 | 201 |

B45 5.3 gms²
 14 80 Tons

367CD

AB found normal temp
 CD n 130 day
 DEF 35° day

| | V C | 1/2 | V | 1/2 |
|----|-------|-------|-------|-------|
| 1 | 63.5 | 64.5 | 64.2 | 65 |
| 2 | 62.5 | 64.2 | 61.5 | 62.7 |
| 3 | 59 | 59.5 | 61.5 | 62.1 |
| 4 | 61 | 62 | 63 | 64.2 |
| 5 | 89.2 | 94.5 | 86.7 | 97 |
| 7 | 89.2 | 98.5 | 87 | 101.2 |
| 9 | 93 | 105 | 96 | 103.5 |
| 11 | 95 | 107 | 98 | 110 |
| 12 | 95 | 107 | 97 | 110 |
| 13 | 95 | 107 | 97 | 110 |
| 14 | 96.5 | 108.2 | 99.6 | 111 |
| 15 | | | | |
| 16 | 97.5 | 109.5 | 100.5 | 114.2 |
| 17 | 100 | 111 | 102.5 | 116 |
| 18 | 100 | 112 | 102.7 | 115.2 |
| 31 | 102.5 | 113.6 | 106.5 | 118.6 |
| 40 | 107.2 | 118.7 | 109.7 | 122.2 |
| 77 | 107 | 117 | 108.5 | 121 |
| 84 | 105 | 115 | 107 | 120 |

at 130° F. low
 " " " " " "

normal but
 difference best

367AB

V A 1/2

B

| | V A | 1/2 | B |
|----|-------|-------|-------|
| 1 | 111 | 115.5 | 107.5 |
| 2 | 100 | 102.5 | 100.7 |
| 4 | 88.7 | 97.7 | 88.7 |
| 4 | 95.2 | 109 | 95.2 |
| 5 | 86.7 | 101.2 | 86.7 |
| 7 | 91 | 101.7 | 91.7 |
| 7 | 96 | 105.7 | 97 |
| 11 | 98 | 107 | 100 |
| 12 | 97 | 107 | 100 |
| 13 | 97 | 106 | 100 |
| 14 | 99.2 | 107.5 | 107 |
| 15 | | | |
| 16 | 100 | 108.5 | 101.5 |
| 17 | 101.6 | 110 | 102.5 |
| 18 | 102.5 | 110.5 | 102.7 |
| 31 | 101.8 | 109.7 | 101.8 |
| 40 | 106.2 | 117.2 | 107.2 |
| 77 | 108.2 | 117.5 | 108.2 |
| 84 | 105 | 114 | 107 |

Normal Temp

Normal

367 EF

| | E | | F | |
|----|-------|-------|-------|-------|
| 1 | 47 | 59.2 | 45 | 58.7 |
| 2 | 47.5 | 63.5 | 47.5 | 63.2 |
| 3 | 43.2 | 63.4 | 40 | 59.5 |
| 4 | 42 | 64.5 | 37.5 | 60.7 |
| 5 | 91.2 | 98.7 | 90 | 97.5 |
| 7 | 88 | 91 | 87.7 | 91 |
| 9 | 91.5 | 96 | 92.5 | 96.7 |
| 11 | 94 | 98 | 95 | 99 |
| 12 | 95 | 102 | 95 | 100 |
| 13 | 97 | 99 | 95 | 99 |
| 14 | 97.5 | 102.2 | 97.5 | 104.3 |
| 15 | | | | |
| 16 | 98 | 103 | 98.2 | 103.2 |
| 17 | 99 | 104.3 | 100 | 104.2 |
| 18 | 100 | 105.8 | 100.2 | 105 |
| 31 | 98.6 | 106.8 | 98.5 | 104.6 |
| 40 | 102.5 | 108.7 | 102.5 | 109 |
| 77 | 103.7 | 113.2 | 104.3 | 114.2 |
| 84 | 102 | 111 | 104 | 114 |

35° fahn

"

"

Normal

"

"

"

"

"

381-1/2 A 4 B —

2 Reg Check Cells

2 Special Cells grown from seed
of Brown products -

335

| | | | |
|----|------|------|-------------------|
| 53 | 3067 | 2200 | Normal |
| 55 | 2087 | 1187 | |
| 56 | 2170 | 1212 | |
| 57 | 2162 | 1300 | High density rate |
| 58 | 3133 | 2367 | Normal - |
| 59 | 2947 | 2307 | " |
| 60 | 2993 | 2347 | " |
| 61 | 2933 | 2376 | " |
| 62 | 2867 | 2287 | Hephrata |
| 63 | 2125 | 1257 | " |
| 64 | 2250 | 1412 | |
| 65 | 2150 | 1412 | |
| 66 | 3053 | 2250 | Normal |
| 67 | 2913 | 2233 | |
| 82 | 2960 | 2997 | Normal |
| 88 | 2212 | 2200 | Hephrata |
| 91 | 2653 | 2700 | |

333

Hyphra 110 2613 2567
114 2062 2062

336-

| | | | |
|----|------|------|-----------|
| 53 | 2967 | 3020 | Normal |
| 54 | 2037 | 2162 | High rate |
| 56 | 1937 | 2225 | " |
| 57 | 1925 | 2187 | " |
| 58 | 2900 | 3133 | Normal |
| 59 | 2600 | 2947 | " |
| 60 | 2487 | 3013 | " |
| 61 | 2267 | 2933 | " |
| 62 | 2267 | 2867 | " |
| 63 | 2487 | 2225 | Hephrata |
| 64 | 1537 | 2312 | " |
| 65 | 1375 | 2337 | " |
| 66 | 2287 | 3073 | Normal |
| 67 | 2013 | 2907 | |
| 82 | 2307 | 2913 | Normal |
| 88 | 2300 | 2137 | High rate |
| 91 | 2500 | 2713 | Normal |

334

Hyphra 110 2660 2533
114 2000 1962

30
2426
20
23290
2362

366-

| | A | A | B | B | C | C | D | D |
|----|-------|-------|-------|-------|-------|-------|-------|-------|
| | 182.5 | 197.7 | 183 | 198 | 181.5 | 204.2 | 181 | 201.5 |
| 20 | 197 | 211.7 | 196.7 | 212.2 | 194 | 220 | 194.7 | 216.7 |
| 21 | | | | | | | | |
| 22 | 46.7 | 175.8 | 45.8 | 175.8 | 45 | 166.7 | 45 | 161.7 |
| 37 | 218 | 225.7 | 211.2 | 227.5 | 209.7 | 233 | 208.2 | 228 |
| 47 | 197.5 | 211.5 | 195 | 213.5 | 194.5 | 215 | 197.5 | 213 |
| 90 | 194 | 265 | 194 | 209 | 192 | 211 | 193 | 209 |

100 amp

| | E | E | I | I |
|----|-------|-------|-------|-------|
| 20 | 181.7 | 194 | 182 | 195 |
| 21 | 195.5 | 207.5 | 195.7 | 210 |
| 22 | 45.8 | 175 | 45.8 | 176.7 |
| 37 | 218 | 222.2 | 211.2 | 225 |
| | 197.5 | 210 | 197.5 | 212 |
| | 193 | 205 | 193 | 207 |

Resistor may not be reliable

100 amp

[ITEMS(S) FOUND IN BOOK]

August 15, 1914.

WMA-16-4349

Messrs. Edison-Bachman-McClain-H.H. Smith and file-

Request Mr. Edison S.O. #4867-S
Make up 2 A-4 cells.

#704 Mach. Special Iron Mix Exp. #2109

Dumps 15-25) A pocket
Weight 7.768)

Remarks- Gritty greyish iron, very bulky pockets and
iron both became slightly warm.

#824 Hi.(OH)2 = .02855 per dump
Lot 266 Hi.Flake = .00371 " "
Dumps per tube = \$13
Weight " = 10.683

Serial numbers from H. H. Smith.
S.P. #60 and S.P. #61
Sent to Research Dept. August 15, 1914.

W. H. ARCHER.

[ITEMS(S) FOUND IN BOOK]

August 13, 1914.

WMA-16-4548

Messrs. Edison-McClain-H.H.Smith-& file:-

Request Mr. Edison S.O. #4615-B.
Make 4 A-4 cells.

2 cells regular factory stock
2 cells special and use pocket stock which has been ground
#429 Mach. #2989 Iron mix

Dumps 12-16) A pockets
Weight 8.265)

Remarks loading O.K.

#824 Ni.(O.H.)C = .02855 per dump
Lot 266 Hi. Flake = .00371 " "
Dumps per tube = 313
Weight " " = 10.683

2 regular cells factory serial (#8382B & #8383B.
2 special cells ground pocket stock serial numbers from
Mr. H.H. Smith. S.P. #56 and S.P. #57
Sent both sets to research August 12, 1914.

W. H. ARCHER.

[ITEMS(S) FOUND IN BOOK]

11-12-14

The Expts.

| | | Volt | \pm Volt |
|------|--------|-------|------------|
| 366A | Run 42 | 198.5 | 212.7 |
| " B | " | 198.7 | 213 |
| " C | " | 199.2 | 219 |
| " D | " | 198.2 | 214 |
| " E | " | 198 | 210 |
| " F | " | 199 | 212 |

| | | Volt | \pm Volt |
|------|--------|-------|------------|
| 367A | Run 36 | 103 | 109 |
| " B | " | 104.2 | 113 |
| " C | " | 104.6 | 114 |
| " D | " | 105 | 119.7 |
| " E | " | 100 | 105.7 |
| " F | " | 99 | 105.2 |

at normal rate

| | | |
|-----|--------|-----------|
| 378 | Run 41 | 2000-2193 |
| 379 | " | 2447-2373 |
| 380 | " | 2513-2267 |

[ITEMS(S) FOUND IN BOOK]

11-12-14

Exp. 26. (The Vignette - 1000000)

Exp. 26. (The Vignette - 1000000)

| 12-hour change | | 7-hour change | |
|----------------|---------------|---------------|---------------|
| 18 Oct. 12:00 | 18 Oct. 12:00 | 18 Oct. 12:00 | 18 Oct. 12:00 |
| Run 169-170 | 171.185 | 170.5186 | 164.2, 164.2 |

[ITEMS(S) FOUND IN BOOK]

File Expts 11-12-14

| | | 1 Volt | $\frac{1}{2}$ Volt | 1 Volt | $\frac{1}{2}$ Volt |
|-----|--------|--------|--------------------|--------|--------------------|
| 353 | Run 62 | 205.7 | 220 | 205.2 | 217.5 |
| 354 | " | 207.2 | 218.5 | 206.2 | 219 |

At high rate

| | | 1 Volt | 9 Volt | .5 Volt | 1 Volt | 9 Volt | .5 Volt |
|-----|--------|--------|--------|---------|--------|--------|---------|
| 358 | Run 60 | 70 | 165 | 206.7 | 60 | 160 | 206.7 |

At high rate

| | | 1 Volt | 9 Volt | .5 Volt | 1 Volt | 9 Volt | .5 Volt |
|-----|--------|--------|--------|---------|--------|--------|---------|
| 359 | Run 60 | 68.3 | 125 | 213.2 | 68.3 | 120 | 203.2 |
| 360 | " | 68.3 | 118.3 | 200 | 68.3 | 125 | 206.7 |
| 361 | " | 75 | 133.2 | 225 | 68.3 | 135.8 | 226.7 |

At normal rate

| | | |
|-----|--------|-----------|
| 365 | Run 46 | 2573-2447 |
|-----|--------|-----------|

[ITEMS(S) FOUND IN BOOK]

11-12-14

Ni Experiments

| | | | | |
|-------------------|---------|---------------------|--------|---------------------|
| Exp. 240 (Cobalt) | Run 113 | | | |
| | 1 Volt | $\frac{9}{16}$ Volt | 1 Volt | $\frac{9}{16}$ Volt |
| Actual | 175 | 190 | 174.2 | 188.8 |
| Equivalent | 187.5 | 203.5 | 186.7 | 202 |

| | | | | |
|--------------------|---------|---------------------|-------|--|
| Exp. 351 (Bismuth) | Run 214 | | | |
| | 1 Volt | $\frac{9}{16}$ Volt | | |
| | | 200 | 203.8 | |

| | | | | | | |
|----------|--------|-------------------|--------|-------------------|--------|-------------------|
| Exp. 371 | Run 46 | | | | | |
| | 1 Volt | $\frac{16}{17}$ V | 1 Volt | $\frac{16}{17}$ V | 1 Volt | $\frac{16}{17}$ V |
| | 97 | 95 | 80 | 88.7 | 87.5 | 91.2 |

| | | | |
|-----|--------|--|-----------|
| 372 | Run 39 | | 1207-1230 |
| 373 | " | | 1320-1267 |
| 374 | " | | 1343-1223 |
| 375 | " | | 1317-1207 |
| 376 | " | | 1327-1350 |
| 377 | " | | 1340-1330 |

[ITEMS(S) FOUND IN BOOK]

Nov. 12, 1914

Experiments

| | | |
|------|--------|-------------|
| 333X | Run 41 | 31.61-32.74 |
| 334X | " | 27.70-29.89 |
| 335X | " | 31.69-31.73 |
| 336X | " | 30.83-31.24 |

At normal rate

| | | |
|-----|---------|-----------|
| 333 | Run 109 | 2533-2413 |
| 334 | " | 2533-2387 |

At high rate

| | | |
|-----|--------|-----------|
| 335 | Run 87 | 2025-2025 |
| 336 | " | 2212-2037 |

At 800 M.G.

| | | | | |
|------|------------|-------------|--------|-----------|
| 349 | Oct #2 Die | } Special { | Run 80 | 1254-1760 |
| " #4 | " | | " | 1774-1360 |
| " #2 | " | } Regular { | " | 1814-1840 |
| " #4 | " | | " | 1386-1626 |

[ITEMS(S) FOUND IN BOOK]

11-12-11

Je Experiments

348E

At 750 M.A.

| | Run | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|
| | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 |
| Regular | 2693 | 2600 | 2540 | 1850 | 1862 | 1950 | 2080 | 2573 |
| " | 2647 | 2587 | 2500 | 1862 | 1862 | 1950 | 2623 | 2553 |
| " | 2640 | 2520 | 2387 | 1850 | 1762 | 1775 | 2613 | 2527 |
| " | 2187 | 2320 | 2167 | 1637 | 1412 | 1437 | 2155 | 2113 |
| Off # 2102 | 2907 | 2813 | 2707 | 2125 | 2037 | 2125 | 2773 | 2700 |
| " | 2800 | 2767 | 2613 | 2062 | 1962 | 2075 | 2720 | 2627 |
| Off # 11 10 | 2920 | 2820 | 2673 | 2062 | 1975 | 2087 | 2773 | 2647 |
| " | 2980 | 2820 | 2673 | 2125 | 2037 | 2137 | 2800 | 2647 |

[ITEMS(S) FOUND IN BOOK]

Dec. 3, 1914-

The Experiment

| | | |
|------|--------|---------------|
| 333X | Run 55 | 30.75 - 31.88 |
| 334X | " | 27.0 - 29.19 |
| 335X | " | 31.32 - 31.32 |
| 336X | " | 31.39 - 30.75 |

| | at present | at present |
|-------------|------------|-------------------|
| 333 Run 126 | 2260-2320 | Run 127 2253-2313 |
| 334 " | 2500-2167 | " 2560-2212 |

| | at present | at present |
|------------|------------|-----------------|
| 344 Run 81 | 380-1730 | Run 82 380-1605 |

| | at 800 m.c. |
|--------------------|-------------|
| 349 Oct # 2 Run 96 | 1080-1560 |
| " 4 1 " } Special | " 1706-1066 |
| " 4 2 " } Regular | " 1614-1654 |
| " 4 4 " } | " 1174-1266 |

[ITEMS(S) FOUND IN BOOK]

Rec. 2/19/51

City of ...

| | | 1 Volt | 1/2 Volt | 1 Volt | 1/2 Volt |
|-----|--------|--------|----------|--------|----------|
| 353 | Run 76 | 206.2 | 220 | 204.5 | 218.7 |
| 354 | " | 205.2 | 218.5 | 204 | 217.5 |

| | | 1 Volt | 1/2 Volt | 1 Volt | 1/2 Volt |
|-----|--------|--------|----------|--------|----------|
| 352 | Run 67 | 104 | 109 | 104.5 | 111.2 |
| 355 | " | 106 | 111.2 | 106.7 | 111 |

at highway

| | | 1 Volt | 1/2 Volt | 1 Volt | 1/2 Volt | 1 Volt | 1/2 Volt |
|-----|--------|--------|----------|--------|----------|--------|----------|
| 358 | Run 78 | 66.7 | 163.2 | 210 | 50 | 158.2 | 211.7 |

| | | 1 Volt | 1/2 Volt | 1 Volt | 1/2 Volt |
|-----|--------|--------|----------|--------|----------|
| 359 | Run 74 | 197.5 | 216.5 | 195.5 | 212.7 |
| 360 | " | 192.5 | 208.7 | 197 | 213 |
| 361 | " | 195 | 214.2 | 197 | 216 |

at normal rate

| | | |
|-----|--------|-----------|
| 365 | Run 62 | 2480-2360 |
|-----|--------|-----------|

[ITEMS(S) FOUND IN BOOK]

December 3, 1914

Free Experiments

At 750 m.m. per 32 Picket

| | 1 Volt | $\frac{1}{2}$ Volt | 1 Volt | $\frac{1}{2}$ Volt | |
|------------|--------|--------------------|--------|--------------------|----------------|
| 381 Run 70 | 164 | 217 | 159.5 | 213.5 | Regulator |
| " " | 160 | 212.5 | 159 | 206 | Battery ground |

At 35° Fahr

| | | |
|-----|-------|-----------|
| 385 | Run 8 | 747-1580 |
| 386 | " | 487-553 |
| 387 | " | 1060-1647 |
| 388 | " | 1207-913 |
| 389 | " | 1487-367 |
| 390 | " | 453-1587 |
| 391 | " | 0-1487 |
| 392 | " | 420-1487 |
| 393 | " | 1200-180 |

[ITEMS(S) FOUND IN BOOK]

Dec. 3, 1914

Ni Experiments

Exp. 351 (Bismuth)

Run 229

| | |
|--------|---------------------|
| 1 Volt | $\frac{9}{16}$ Volt |
| 203.2 | 207 |

Exp. 371

Run 61

| | | | | | |
|--------|---------------------|--------|---------------------|--------|---------------------|
| 1 Volt | $\frac{9}{16}$ Volt | 1 Volt | $\frac{9}{16}$ Volt | 1 Volt | $\frac{9}{16}$ Volt |
| 92.5 | 94.2 | 83.7 | 85.7 | 88 | 91.2 |

372

Run 56

1213-1257

373

1333-1287

374

1287-1220

375

1287-1160

376

1270-1300

377

1267-1277

[ITEMS(S) FOUND IN BOOK]

December 4, 1914

| <u>See Experiments</u> | | 1 Volt | $\frac{1}{2}$ Volt |
|------------------------|--------|--------|--------------------|
| 366 A | Run 56 | 198 | 211 |
| " B | " | 198.5 | 211.5 |
| " C | " | 198.7 | 217 |
| " D | " | 198.5 | 213.5 |
| " E | " | 197.2 | 208.5 |
| " F | " | 198 | 210.5 |

| | | 1 Volt | $\frac{1}{2}$ Volt |
|-------|--------|--------|--------------------|
| 367 A | Run 50 | 108.7 | 116.5 |
| " B | " | 109 | 114.2 |
| " C | " | 108.7 | 118 |
| " D | " | 112.5 | 124.5 |
| " E | " | 104 | 111.5 |
| " F | " | 104.2 | 112 |

| | | <u>At normal rate</u> |
|-----|--------|-----------------------|
| 378 | Run 57 | 2067 - 2167 |
| 379 | " | 2400 - 2360 |
| 380 | " | 2467 - 2193 |

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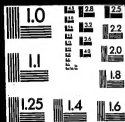
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